AIWA®

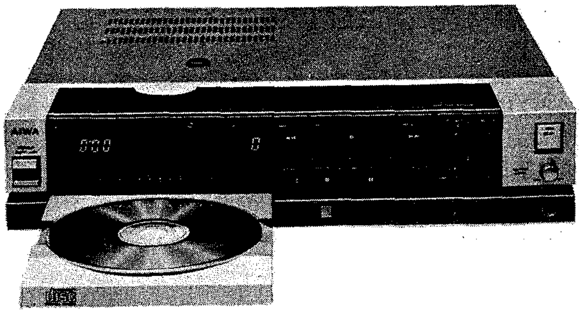
S/M Code No. 83-026

SERVICE MANUAL

FULL AUTOMATIC COMPACT DISC PLAYER

MODEL NO.

DX-1000



TYPE. H,E,K,Z

SPECIFICATIONS

Type:	Compact disc player
Semiconductors:	79 ICs, 2 FETs, 77 transistors, 2 photo interrupters, 1 photo transistor, 96 diodes, 13 LEDs
Power source:	H model AC 120V/220V/240V, 50/60 Hz E, Z models AC 220V, 50/60 Hz K model AC 240V, 50/60 Hz
Power consumption:	H, E, Z models 42W K model 45W
Dimensions:	330(W) x 71(H) x 298(D) mm
Weight:	5.6 kg
No. of channels:	2 channels
Digitization quantity:	16 bits
Sampling frequency:	44.1 kHz
Frequency response:	DC ~ 20 kHz 2 Hz ~ 20 kHz (Switch-controlled)
Dynamic range:	More than 90 dB
Signal-to-noise ratio:	More than 93 dB (20 kHz LPF)
Separation: (L→R)	More than 90 dB (1 kHz) More than 87 dB (20 kHz)

Harmonic distortion ratio:	0.0028% (1 kHz) 0.007% (7 kHz)
REC calibration output:	–15 dB ± 0.5 dB
Wow and flutter:	Quartz oscillatory precision
Deflation:	More than 6 (±180 at screw)
(Radial skew)	[1.2 m/s. DISC] (0 dB)
DC off-set:	Less than 5mV (L, R)
Output level:	2V ± 0.5 dB ..... L ch 2V ± 0.5 dB ..... R ch L/R Deviation .... Less than 0.5 dB
Component-outside-band rejection:	More than 70 dB
De-emphasis:	–0.37 ± 0.5 dB (1 kHz) –4.53 ± 0.5 dB (5 kHz) –9.04 ± 0.5 dB (16 kHz)
Output:	FIX OUTPUT 2V (0 dB) VARIABLE OUTPUT 0 ~ 3V (0 dB) Headphone 0.2mW/8Ω (–15 dB)

- Specifications and external appearance are subject to change without due to product improvement.

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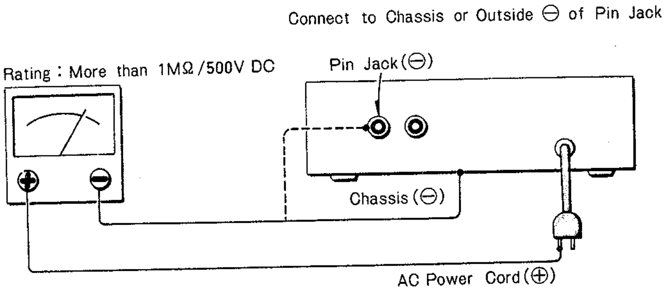
Follow the instructions carefully, which will allow the user to optimise the products' performance and give many years of serivce.

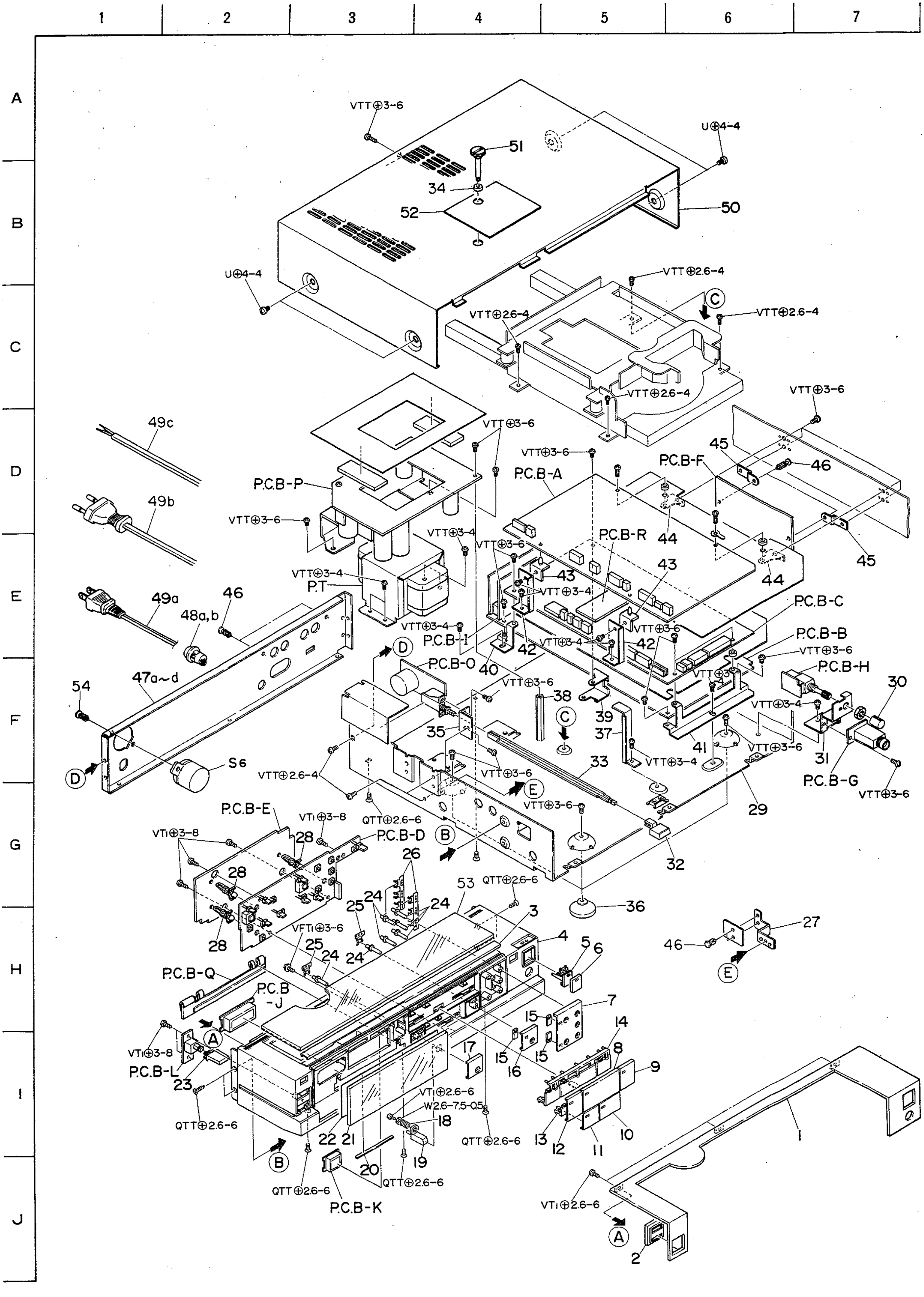
1. **No scratch and melting shall be made to covered lead-wires of an a.c. primary circuit including mains leads.**
2. **No illegibility shall be given to the specification plate, the caution labels, the fuse labels and others.**
3. **When, on pattern sides of circuit boards, additional repair-parts have been made up, the parts shall be firmly glued to circuit boards or other components, unless the parts can be attached firmly.**
4. **The following matters shall be maintained as they are, when repairing.**
   1) Soldering of lead-wire ends
      * Care should be taken of the space distance in an a.c. primary circuit as well as soldering.
   2) Wiring and holding of lead-wires with wire-clips and binders
   3) Materials of lead-wires
      * e.g.; For UL models, lead-wires to be used shall be approved or accepted by the UL.
   4) Location of all kinds of insulators
   5) Setting of voltage selector switch
      * Set the Voltage Selector Switch to 240V, 220V, or 120V, According to your Local Voltage.
5. **After repaired, the insulation resistance or leakage current shall be measured with 500 ± 5V D.C and shall be not less than 1MΩ.**

Measuring Point


Connect to Chassis or Outside ⊖ of Pin Jack
Rating : More than 1MΩ/500V DC
Pin Jack(⊖)
⊕
⊖
Chassis (⊖)
AC Power Cord(⊕)

6. General instructions for mechanism repair
   1) Lubricants been stained the surfaces of transmitting portion of the belts, idlers, capstan and pinch roller shall be removed, because slippery and faulty tape travel shall be caused.
   2) When oiling, only one or two drops shall be applied so as not to run over and be dispersed. Note should be taken of the metal fitting for the capstan and rotating portions of the idlers and pinch roller, especially.
   3) E-rings and poly slider washers shall be replaced with new ones, if once those have been removed. – No re-utilization due to unreliability.
   4) Regular spare-parts shall always be used for repair, because using irregular parts and tampering with the products shall cause deterioration, mulfunction and damage.

EXPLODED VIEW-1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VTT⊕3-6
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U⊕4-4
VTT⊕2.6-4
C
VTT⊕2.6-4
VTT⊕2.6-4
VTT⊕2.6-4
VTT⊕3-6
49c
VTT⊕3-6
VTT⊕3-6
45
P.C.B-F
46
P.C.B-P
P.C.B-A
49b
VTT⊕3-6
VTT⊕3-4
VTT⊕3-6
P.C.B-R
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VTT⊕3-4
VTT⊕3-4
49a
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P.T
48a, b
VTT⊕3-4
VTT⊕3-6
P.C.B-C
P.C.B-I
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P.C.B-B
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VTT⊕3-6
P.C.B-O
P.C.B-H
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47a~d
VTT⊕3-6
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VTT⊕3
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C
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VTT⊕3-4
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VTT⊕3-6
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S6
VTT⊕2.6-4
VTT⊕3-6
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VTT⊕3-4
P.C.B-G
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VTT⊕3-6
P.C.B-E
VTI⊕3-8
VTT⊕3-6
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VTI⊕3-8
QTT⊕2.6-6
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QTT⊕2.6-6
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VFTI⊕3-6
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P.C.B-Q
P.C.B
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VTI⊕3-8
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P.C.B-L
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VTI⊕2.6-6
W2.6-7.5-0.5
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QTT⊕2.6-6
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QTT⊕2.6-6
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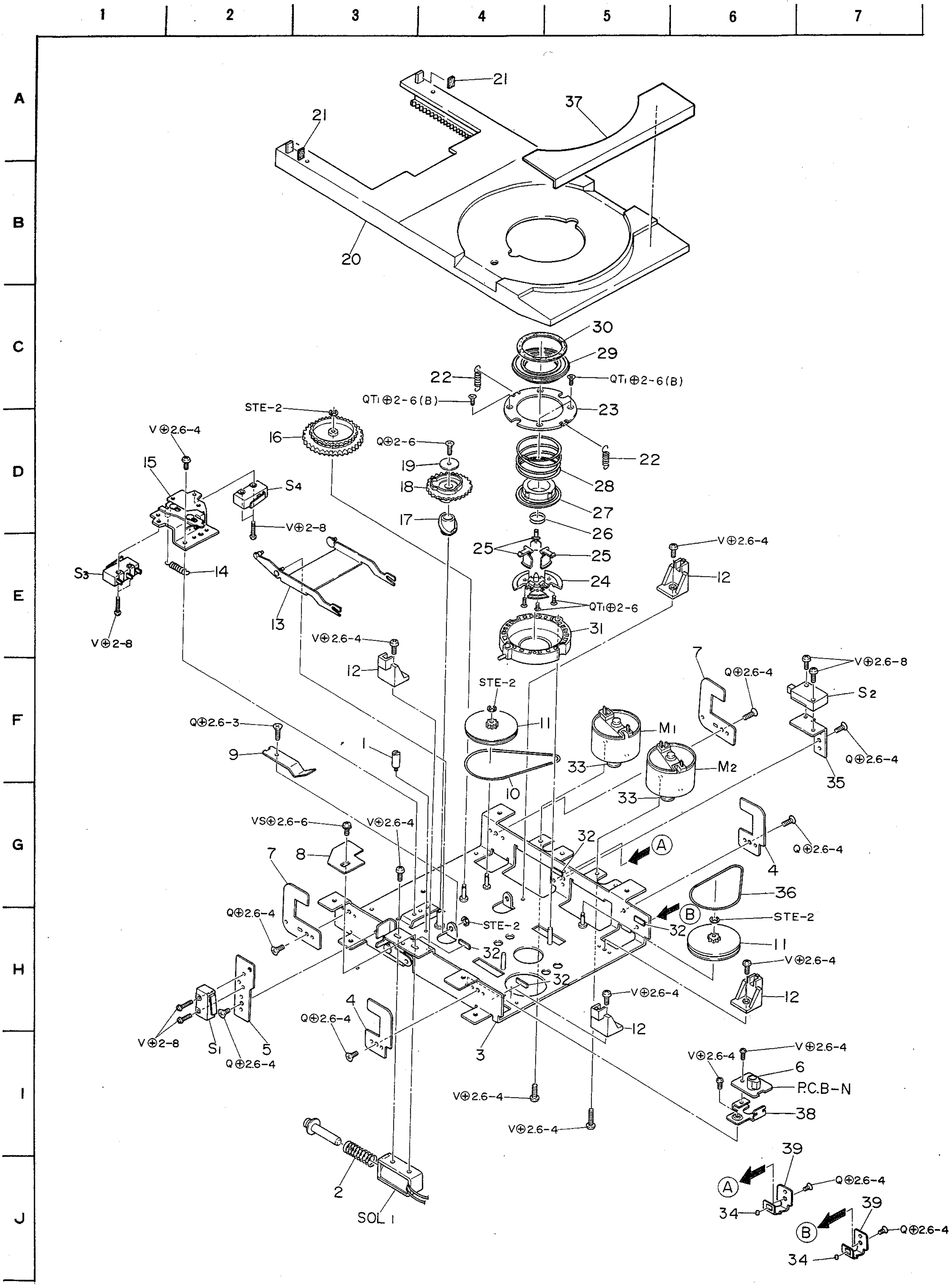
QTT⊕2.6-6
QTT⊕2.6-6
P.C.B-K
VTI⊕2.6-6
A
2

PARTS LIST

MECHANICAL PARTS

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1-1	84-700-022-01		Panel, Front	*	1
1-2	84-700-024-01		Guide, Power	*	1
1-3	84-700-020-01		Escutcheon plate, Top	*	1
1-4	84-700-021-21		Cabinet, Front	*	1
1-5	84-700-028-11		Guide, Scan touch-key	*	1
1-6	84-700-016-01		Push-key, Scan	*	1
1-7	84-700-013-01		Name plate, Operation	*	1
1-8	84-700-006-01		Push-key, PLAY	*	1
1-9	84-700-008-01		Push-key, FF	*	1
1-10	84-700-009-01		Push-key, Standby	*	1
1-11	84-700-011-01		Push-key, Return	*	1
1-12	84-700-007-01		Guide, Return touch-key	*	1
1-13	84-700-027-11		Guide, Return touch-key	*	1
1-14	84-700-025-01		Guide, PLAY touch-key	*	1
1-15	84-700-029-01		Guide, Operation	*	3
1-16	84-700-010-01		Push-key, REC CAL	*	1
1-17	84-700-012-01		Push-key, Display	*	1
1-18	84-700-273-01		C-spring, Eject	*	1
1-19	84-700-005-01		Push-button, Eject	*	1
1-20	84-700-311-11		Felt 3-50	*	1
1-21	84-700-015-01		Window, Front	*	1
1-22	84-700-302-01		Adhesive sheet	*	1
1-23	84-700-004-01		Push-button, Timer	*	1
1-24	84-700-018-01		Push-button, Display	*	7
1-25	84-700-277-01		P-spring, Display B	*	2
1-26	84-700-276-01		P-spring, Display A	*	2
1-27	84-700-368-01		Holder, Fuse	*	1
1-28	87-064-099-01		Holder, Circuit board		3
1-29	84-700-271-31		Chassis, Amp.	*	1
1-30	84-700-002-01		Knob, Output	*	1
1-31	84-700-274-11		Holder, Jack volume	*	1
1-32	84-700-003-01		Push-button, Power	*	1
1-33	84-700-342-01		Rod, Power	*	1
1-34	84-700-300-01		Rubber cushion	*	1
1-35	84-700-305-01		Holder, Power	*	1
1-36	84-700-231-01		Rubber foot	*	4
1-37	84-700-272-11		Cover, Front cabinet	*	1
1-38	84-700-287-11		Holder, Power circuit board	*	1
1-39	84-700-256-01		Holder, Circuit board C	*	1
1-40	84-700-255-01		Holder, Circuit board B	*	1
1-41	84-700-254-01		Holder, Circuit board A	*	1
1-42	84-700-258-01		Holder, Circuit board E	*	2
1-43	87-064-056-01		Holder, Hinge		2
1-44	84-700-257-21		Holder, Circuit board D	*	2
1-45	84-700-314-21		Holder, Circuit board F	*	2
1-46	87-084-077-01		Nylon rivet 3.4-4.5		6
1-47a	84-700-053-01		Panel, Rear (H model only)	*	1
b	84-700-049-01		Panel, Rear (E model only)	*	1
c	84-700-050-01		Panel, Rear (K model only)	*	1
d	84-700-056-01		Panel, Rear (Z model only)	*	1
1-48a	87-085-184-01		Cord bushing (H model only)		1
b	87-085-185-01		Cord bushing (E, K, Z models only)		1
1-49a	87-034-958-01		AC power cord (H model only)		1
b	87-034-877-01		AC power cord (E, Z models only)		1
c	87-034-975-01		AC power cord (K model only)		1
1-50	84-700-057-01		Cabinet, steel	*	1
1-51	84-700-285-01		Red screw	*	1
1-52	84-700-081-01		Caution sheet	*	1
1-53	84-700-014-01		Window, Top	*	1
1-54	87-084-063-01		Nylon rivet ϕ3—5.5 (H model only)		2

EXPLODED VIEW-2



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QT₁⊕2-6(B)
QT₁⊕2-6(B)
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STE-2
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V⊕2.6-4
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Q⊕2-6
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S4
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V⊕2-8
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V⊕2.6-4
S3
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QT₁⊕2-6
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V⊕2-8
V⊕2.6-4
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V⊕2.6-8
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V⊕2.6-4
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Q⊕2.6-4
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Q⊕2.6-4
STE-2
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STE-2
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V⊕2.6-4
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V⊕2.6-4
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Q⊕2.6-4
V⊕2-8
S1
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Q⊕2.6-4
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V⊕2.6-4
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P.C.B-N
V⊕2.6-4
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V⊕2.6-4
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A
Q⊕2.6-4
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SOL 1
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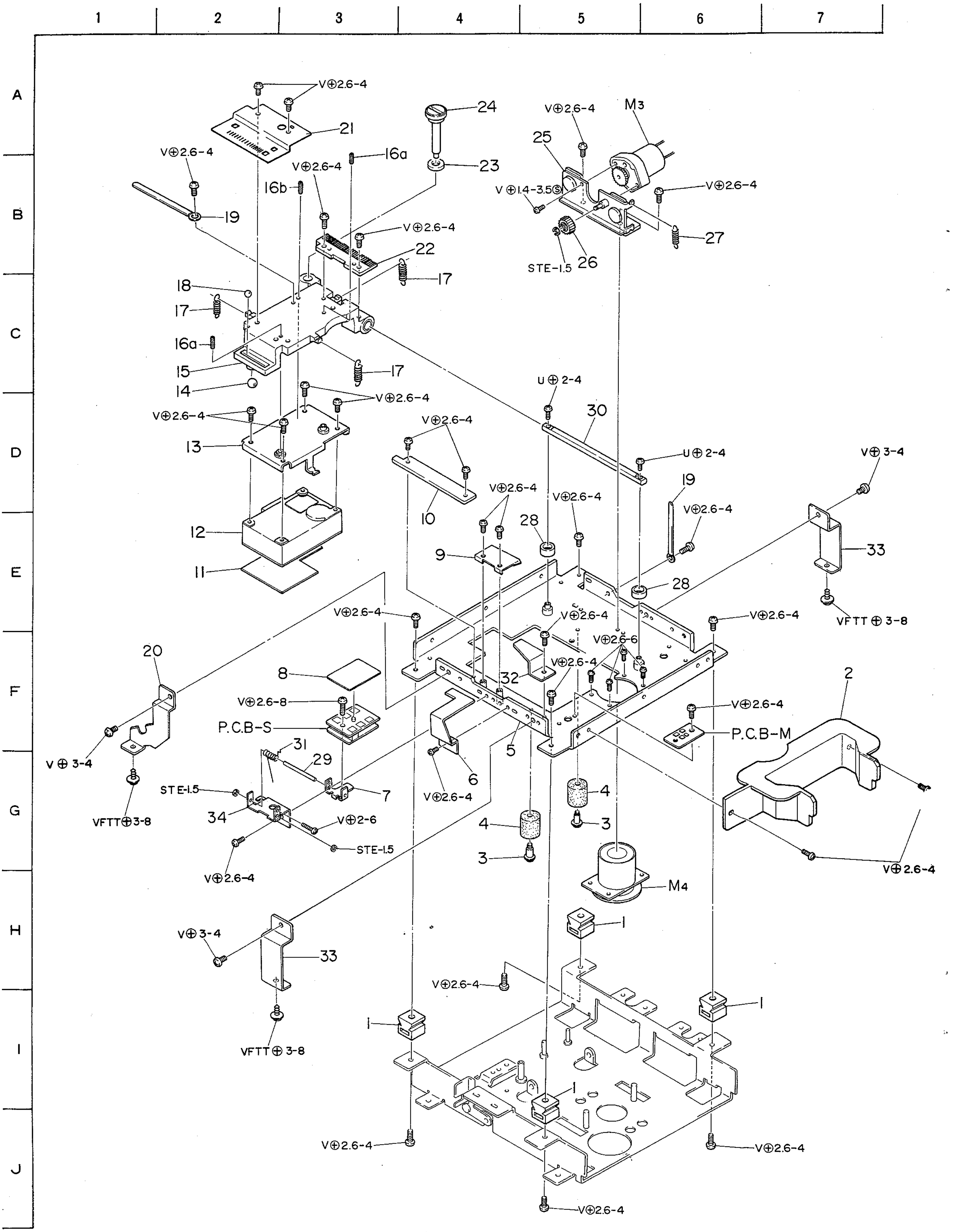
B
Q⊕2.6-4
34

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty	
2-1	84-700-330-01		Stopper, Lift arm	*	1	
2-2	84-700-293-01		C-spring, Solenoid	*	1	
2-3	84-700-205-31		Mechanism sub chassis ass'y	*	1	
2-4	84-700-340-11		Stopper, Mechanism	*	2	
2-5	84-700-221-11		Holder, SW1	*	1	
2-6	82-641-210-01		Holder, ECM		1	
2-7	84-700-309-01		Stopper, Mechanism BR	*	2	
2-8	84-700-299-01		Stopper, Try L	*	1	
2-9	84-700-220-01		P-spring, Lift	*	1	
2-10	84-700-301-21		Rubber belt, Lift B	*	1	
2-11	84-700-224-11		Gear, Load	*	2	
2-12	84-700-218-11		Guide, Try	*	4	
2-13	84-700-226-01		Lift arm ass'y	*	1	
2-14	84-700-268-01		E-spring, SW3	*	1	
2-15	84-700-279-11		Holder SW3 ass'y	*	1	
2-16	84-700-223-01		Gear, Relay	*	1	
2-17	84-700-303-21		Cam, Lift	*	1	
2-18	84-700-235-31		Gear, Lift	*	1	
2-19	84-700-225-01		Washer 12-2	*	1	
2-20	84-700-026-21		Try ass'y	*	1	
2-21	84-700-313-01		G cushion, Eject	*	2	
2-22	84-700-290-11		E-spring, Guide	*	2	
2-23	84-700-264-01		Guide, Chuck B	*	1	
2-24	84-700-265-11		Holder, Chuck A	*	1	
2-25	84-700-267-11		Slide hook, Chuck	*	3	
2-26	84-700-291-11		Rubber belt, Chuck	*	1	
2-27	84-700-233-01		Holder, Chuck C	*	1	
2-28	84-700-232-01		C-spring, Chuck	*	1	
2-29	84-700-266-01		Holder, Chuck B	*	1	
2-30	84-700-234-11		Felt, Chuck	*	1	
2-31	84-700-263-01		Guide, Chuck A	*	1	
2-32	84-700-312-01		Felt, 4-15	*	4	
2-33	84-700-219-01		Motor pulley	*	2	
2-34	84-700-283-01		Roller, Try	*	2	
2-35	84-700-278-01		Holder, SW2	*	1	
2-36	84-700-217-11		Rubber belt, Load	*	1	
2-37	84-700-023-01		Panel, Try	*	1	
2-38	84-700-286-01		Holder, Disk sensor	*	1	
2-39	84-700-212-01		P-spring, Try	*	2	

EXPLODED VIEW-3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M3
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V⊕2.6-4
V⊕1.4-3.5Ⓢ
V⊕2.6-4
V⊕2.6-4
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16b
V⊕2.6-4
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STE-1.5
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VFTT⊕3-8
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V⊕2.6-4
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V⊕2.6-4
P.C.B-S
P.C.B-M
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VFTT⊕3-8
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V⊕2.6-4
V⊕2.6-4
V⊕2.6-4

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty	
3-1	84-700-377-01		Rubber foot, Sub chassis B	*	4	
3-2	84-700-030-01		Blind	*	1	
3-3	87-081-483-01		Motor screw, M2.6		2	
3-4	84-700-327-11		G cushion, Disk stopper	*	2	
3-5	84-700-201-31		Mechanism chassis ass'y B	*	1	
3-6	84-700-252-01		Auxiliary plate	*	1	
3-7	84-700-374-01		Holder, Sensor B	*	1	
3-8	84-700-304-01		Cover, Position sensor	*	1	
3-9	84-700-251-11		P-spring, Pick up	*	1	
3-10	84-700-261-01		Slide plate	*	1	
3-11	84-700-292-11		Damper sheet	*	1	
3-12	84-700-737-01		Pick up	*	1	
3-13	84-700-239-11		Pick up holder ass'y	*	1	
3-14	87-073-016-01		Steel ball 5ϕ		1	
3-15	84-700-236-21		Housing	*	1	
3-16a	84-700-249-01		Adjust screw	*	2	
b	84-700-324-01		Adjust sub screw	*	1	
3-17	84-700-288-11		E-spring, Pick up	*	3	
3-18	87-073-006-01		Steel ball, 3ϕ		1	
3-19	87-038-039-01		Wire binder		2	
3-20	84-700-367-01		Holder, Mechanism B_2	*	1	
3-21	84-700-253-01		Chassis, Position sensor	*	1	
3-22	84-700-260-11		Gear, Drive rack	*	1	
3-23	84-700-300-01		Rubber cushion, Red screw	*	1	
3-24	84-700-285-01		Red screw	*	1	
3-25	84-700-243-01		Slide chassis ass'y	*	1	
3-26	84-700-250-11		Gear, Drive	*	1	
3-27	84-700-289-01		E-spring, slide chassis	*	1	
3-28	84-700-262-11		Rubber cushion, Pick up	*	2	
3-29	84-700-375-01		Shaft, Sensor	*	1	
3-30	84-700-248-01		Slide shaft	*	1	
3-31	84-700-376-01		T-spring, Sensor	*	1	
3-32	84-700-306-01		Cover, Housing	*	1	
3-33	84-700-379-01		Holder, Mechanism	*	2	
3-34	84-700-373-01		Holder, Sensor A	*	1	

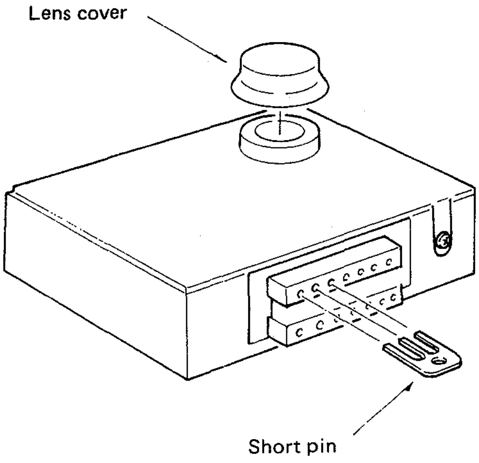
Parts No.	Description
87–262–508–31	V+1.4–3.5
87–261–035–21	V+2–6
87–261–036–21	V+2–8
87–261–071–21	V+2.6–4
87–261–074–21	V+2.6–8
87–261–092–21	V+3–4
87–351–073–21	VT$_1$+2.6–6
87–351–095–21	VT$_1$+3–8
87–081–501–01	VTT+2.6–4
87–067–020–01	VTT+3–4
87–081–511–01	VTT+3–6
87–231–035–21	Q+2–6
87–231–070–21	Q+2.6–3

Parts No.	Description
87–231–071–21	Q+2.6–4
87–321–035–21	QT$_1$+2–6
87–326–035–01	QT$_1$+2–6(B)
87–081–522–01	QTT+2.6–6
87–251–033–21	U+2–4
87–253–167–11	U+4–4
87–481–073–21	VS+2.6–6
87–511–094–21	VFT$_1$+3–6
87–067–090–01	VFTT+3–8
87–441–003–01	STE–1.5
87–441–005–01	STE–2
87–410–211–01	W2.6–7.5–0.5

Caution when replacing Optical Pick-up

1. A short pin is attached to the unit. This short pin must be always attached except that the connector of the circuit board is connected instead of the pin.

2. Before adjusting, a lens cover must be removed.



ADJUSTMENT

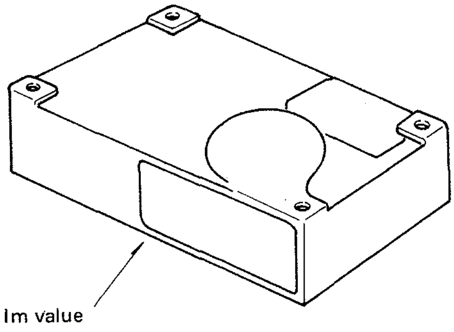
After replacing the pick-up, [1] APC adjustment and [2] Focus & Radial servo adjustment must be carried out. [3] VCO adjustment and others can be individually performed.

The adjustments is not enable if strong lights are casted on the pick-up.

[1] APC (Auto Power Control) Adjustment

*** Caution**

1. Attachment and detachment of the probes must be done after switching power off.
2. If an another probe is used, the probe must not be connected with the ground.
3. More than the APC voltage must not be supplied.



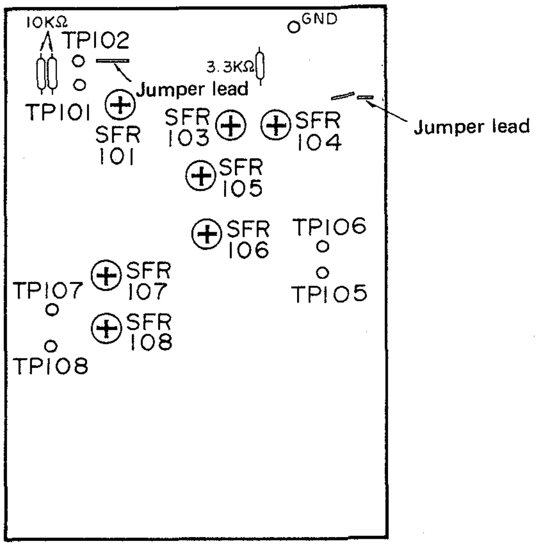
*** APC Voltage**

In case the value of Im is over 0.26 mA,
Im (mA) x 5 (kΩ).

In case the value of Im is less than 0.26 mA,
Im (mA) x 10 (kΩ), but a piece of 10 kΩ is cut.

1. Turn off the power switch, and turn SFR101 down fully counterclockwise.

2. Connect the probe of the oscilloscope;
   (+) side with TP101.
   (-) side with the jumper lead. (Fig. 1)



SFR 103 :	**Radial bias**
SFR 104 :	**Focus bias**
SFR 105 :	**Radial ballance**
SFR 106 :	**Focus ballance**
SFR 107 :	**Focus gain**
SFR 108 :	**Radial gain**

Fig. 1 Servo Circuit Board

3. Disconnect the connector of the CM (Carrying Motor) from the servo circuit board, and shift the pick-up to the center by lifting up the CM.

4. Turn on the power switch, and load a disc in.

5. Adjust SFR101 for the APC voltage.

6. Make certain that the voltage is supplied by repeat of turning the power switch on and off.

7. After turning off the power switch, detach the probe.

[2] Focus & Radial Servo Adjustment

(1) HF (High Frequency) Rough-Adjustment

1. After switching power on without loaded-in disc, turn the unit into the RETURN-STOP position.
   Connect the probe with TP105 while setting the oscillator to 0.1V/Div, DC.

   Then, adjust SFR104 for 0V at TP105.
2. Turn off the power switch and carry out the work of [1]-3.
3. Turn down SFR107, 108.
   Locate SFR103,105,106 to the mechanical center.
4. Connect the probes of the oscillator with the rear lead of 3.3kΩ (CH-1) and TP105 (CH-2).

   At 10 msec/Div.;
   CH-1 2V/Div., CH-2 2 or 5 V/Div.
5. Turn on the power switch and load a disc in.
6. Perform the height adjustment of Fig. 2 to obtain the waveform of Fig. 3.

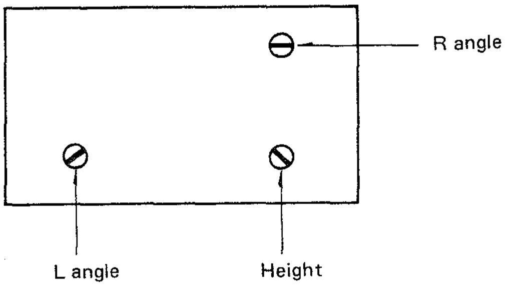


Fig. 2 Pick-up Housing Adjustment Screw

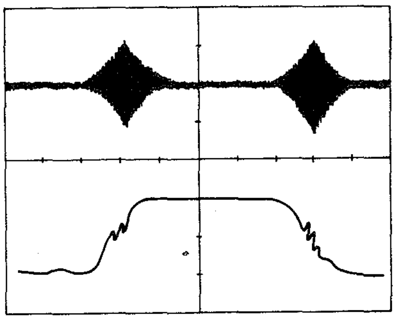


Fig. 3

6. Set the oscilloscope to 0.5 μsec/Div., and turn SFR107, 108 approx. clockwise.
7. Adjust the R angle for a maximum amplitude, and adjust the T angle for a maximum waveform of the shortest amplitude. Adjust further SFR 104 for a maximum HF amplitude. (Fig. 4.)

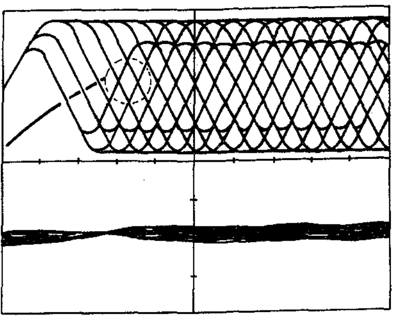


Fig. 4-1

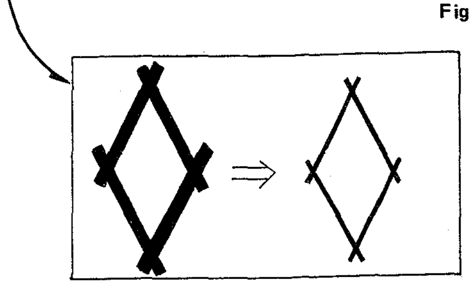


Fig. 4-2

(2) Confirmation of PLAY Function

1. Adjust SFR103 so that the center of the amplitude waveform at TP 106 (Radial error voltage) comes to 0V.
2. Turn off the power switch and connect the connector of the CM.
3. After turning on the power switch, make certain of PLAY function. If no PLAY function, turn SFR 103 30° approx. right and left.

(3) HF Feed-back & Focus Error DC Adjustment

1. Turn the unit into RETURN STOP.
2. Connect the probe of CH-2 with TP 105 (Focus error voltage).
   CH-2 0.5V/Div.
3. Adjust SFR 104 for 0V at TP 105.
4. Turn into PLAY. If no PLAY function, turn SFR 106 60° approx. right and left.

(4) HF Fine-Adjustment and HF Feed-back Output Adjustment

1. Perform the pick-up height adjustment to obtain + 0.1 V at TP 107. Use the probe of CH-2. At 0.5 μsec/Div.;
   CH-1 2V/Div., CH-2 0.5V/Div.

2. Connect the probes of the oscillator with the rear lead of 3.3kΩ (CH-1) and TP105 (CH-2). While keeping D107 short-circuited, adjust the T angle, the R angle and SFR 106 for a big and clear HF signal waveform.

3. Meanwhile, make certain that the HF waveform is not exerted influence by both removing the short-circuited D107 and making it short-circuited again, in PLAY position.

(5) Wedged Disc Adjustment

1. Set the unit to PAUSE mode after loading a wedged disc in. Then, make the cut-off jumper lead (Fig. 1) short-circuited by tweejers.

2. Connect the probe of CH-2 with TP 106.
   At 2 msec/Div.;
   CH-1 2V/Div., CH-2 1V/Div.

3. Adjust SFR 105 so that an'error spot comes to the center of the radial error voltage waveform.

4. Adjust SFR 103 so that the center of the radial error voltage waveform comes to OV. (Fig. 5)

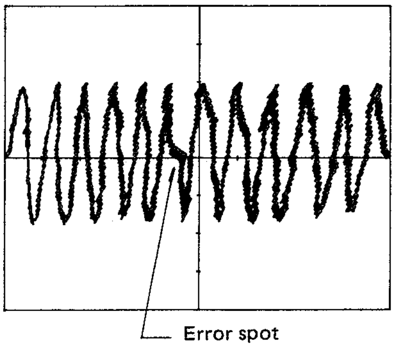


Fig. 5

5. Turn the unit into PLAY after RETURN STOP. Then, make certain that there exists the error spot in the center of the radial error voltage waveform.
   CH-2 0.5V/Div.

6. In PAUSE position, make certain that the error spot comes to OV when the jumper lead is short-circuited by tweezers.
   CH-2 1V/Div.

(6) Gain Adjustment

1. Connect the gain adjustment jig as shown in Fig. 6.

2. Turn the unit into PLAY.

3. Adjust SFR 107 for the focus gain, and adjust SFR 108 for the radial gain.

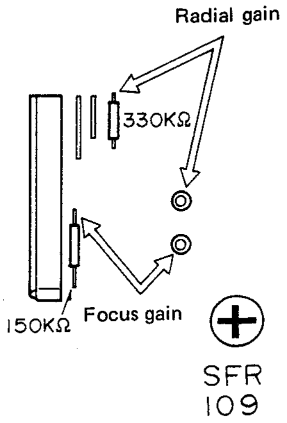


Fig. 6

(7) Wedge Adjustment Confirmation

1. Perform the works of [5]-5 and 6.

[3] VCO Adjustment

(1) Frequency

1. Connect the right lead of 100 kΩ with the ground. (Fig. 7)

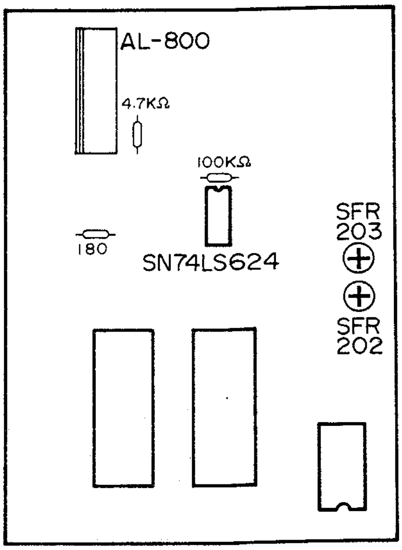


Fig. 7 Micro-computer Circuit Board

2. Connect a frequency counter with Pin-30 of AL-800.

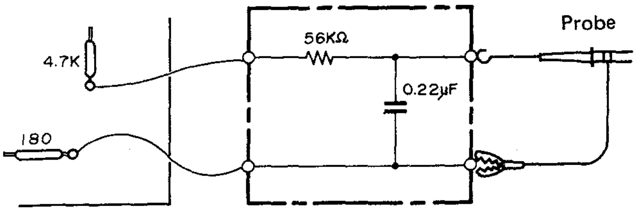
3. Locate SFR 202 to the mechanical center, and turn on the power switch.

4. Adjust SFR 203 for 7.350 ~ 7.351 kHz on the counter display.

5. Disconnect the right lead of 100kΩ from the ground.

(2) Phase

1. Connect the L.P.F. (Low-pass filter) between the front lead of 4.7 kΩ and the right lead of 180Ω as illustrated below.



2. Set the oscilloscope to 5mV/Div. and also the probe to the magnification x 1. Then, connect the probe to the L.P.F.

3. Turn the unit into PLAY, and memorize the voltage occurred at this time.

4. Turn into RETURN STOP, and adjust SFR 202 for equal voltage to the above 3.

5. Make certain of the voltage by both PLAY position and RETURN STOP again.

[4] CM (Carrying Motor) Dynamic Range Adjustment

1. Connect the probe with TP 109.
   At 2msec/Div. (0.5μsec/Div. is allowed); 1V/Div.

2. Adjust SFR 111 so that the center of the sawtooth amplitude comes to OV. (Fig. 8)

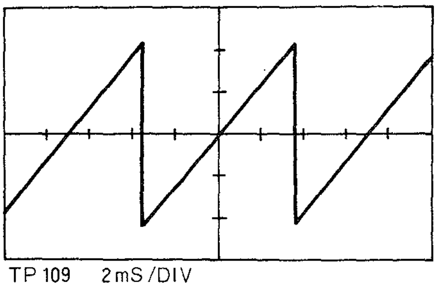


Fig. 8

[5] Search Adjustment

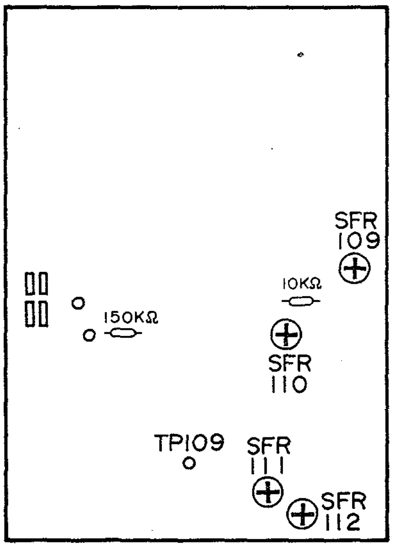


Fig. 9 Servo Circuit Board

(1) Kick pulse

1. Turn the unit into PLAY.

2. Turn SFR110 90° left from the center of the activation range.

3. Connect the probe of the oscilloscope with the left lead of 10kΩ. (Fig. 9)
   At 0.5 msec/Div.; 2 mV/Div.

4. During SF (Slow Foward) and SR (Slow Reverse), turn down SFR 109 until 'SGLJS' of Fig. 10 disappears. (Care should be taken not turn it down too much.)

5. Carry out the above work of 4 at three points on a disc — the inside, center and outside.

6. Connect the probe with the right lead of 150kΩ, and turn the unit into RETURN STOP.

7. Turn into PLAY again, and adjust SFR 112 so that the duty ratio of the kick pulse reaches to 6:4.
   At 0.1 msec / Div. ; 2V/Div.

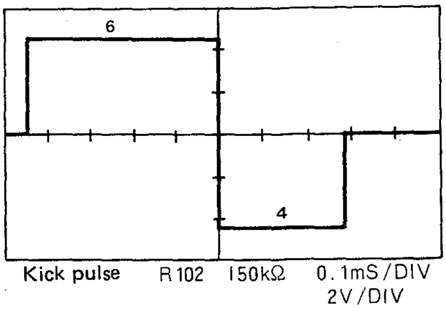


Fig. 10 SGLJS

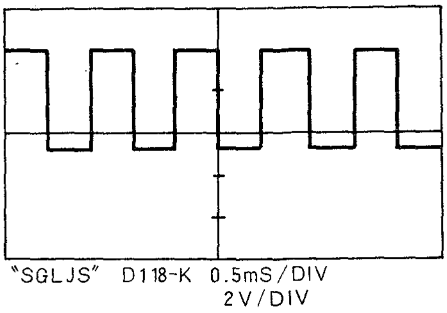


Fig. 11 Kick Pulse at 0.1 msec/Div.

(2) TJS (Track Jump Signal) & Main Search Adjustment

1. After turning SFR 109 down fully, turn it up to double the angle located by the work of [5]-(1)-4.

2. Locate SFR 110 to the mechanical center.

3. Perform MEMORY by setting in order from the first program to the last.

4. Turn the unit into PROGRAM PLAY and carry out BACK SKIP.

5. Adjust SFR 110 so that an quick lead-in search is done so as not to give the pick-up an vibration.

[6] REC CAL Adjustment

1. Connect a mili-volt meter with L and Rch of FIXED OUTPUT, and turn on the DC COUPLING switch.
2. Turn the unit into PLAY of Track No. 1 on the Test Disc ATD-001, and define this output as OdB.
3. Turn up SFR 304 fully clockwise, and press the REC CAL button.
4. Adjust SFR 303 for -10 dB output.
5. Make certain that its oscillation output is 400 ~ 440 Hz with using of a frequency counter.
6. Adjust SFR 304 for -14.8 dB output.

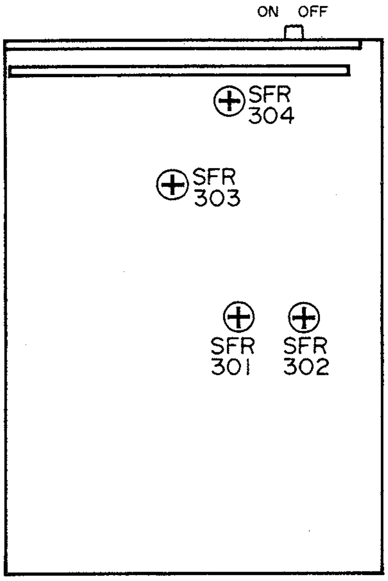


Fig. 12 Audio Circuit Board

[7] Off-set Adjustment

1. Connect the probe of the oscilloscope with FIXED OUTPUT.
   Probe magnification x 1.
   Oscilloscope setting 5 mV/Div.
2. Turn on the DC COUPLING switch.
3. Turn the unit into PAUSE of Track No.1 on the Test Disc (ATD-001).
4. Adjust SFR301 for 0V in Lch, and SFR 302 in Rch.

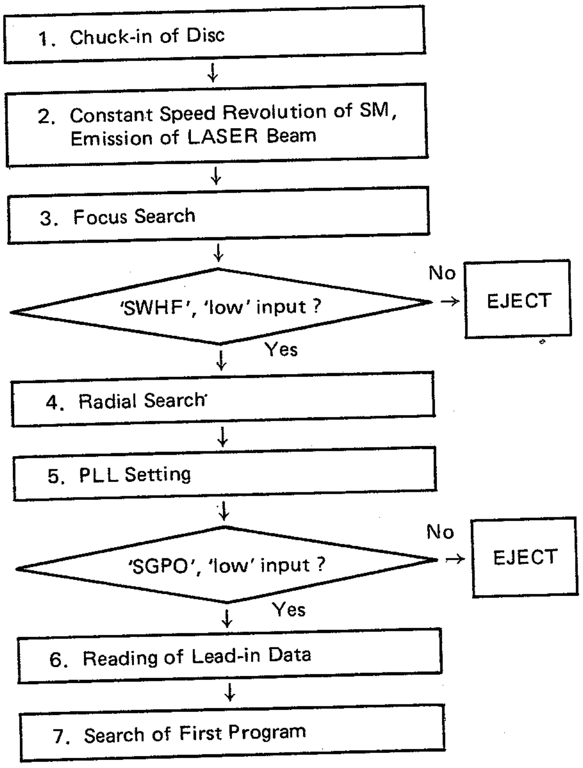
CIRCUIT DESCRIPTION

1. Process after Disc Loaded-in

1. After loading a disc in, the EM (Elevation Motor) starts turning and lifts the chuck to install the disc on the turntable (Spindle Motor : SM).
2. An LASER beam is emitted, and simultaneously the SM starts turning at a constant speed.
3. An focus search is performed. If a disc is put the wrong side out, the EJECT mode is set automatically.
4. An radial search is performed. The SM is turning at a constant speed, so far.
5. A PLL (Phase Locked Loop) is set so as to obtain a CLV (Constant Linear Velocity).
6. The unit reads the data (the number of programs and the total time) which is recorded in the lead-in of disc, and stores it with the search micro-computer.
7. The first program is searched. When pressing the 'PLAY' button, the unit starts to play.

   The above-mentioned is a normal process. In case the TIMER PLAY is set so as to play a desired program, the description is as follows;

   a. In the position where the P.U. (Pick-Up) is remaining, the unit sets the focus and radial servo, and also the PLL simultaneously. Then, it reads the program number at there and stores it with the search controller.
   b. The P.U. returns to the point of the inside limit.
   c. After setting the servo again, the unit reads the data of the lead-in of disc to store.
   d. Then, the unit starts searching the beginning of the program on which the P.U. was situated, and plays the disc at last.


1. Chuck-in of Disc
2. Constant Speed Revolution of SM, Emission of LASER Beam
3. Focus Search
'SWHF', 'low' input ?
No
EJECT
Yes
4. Radial Search
5. PLL Setting
'SGPO', 'low' input ?
No
EJECT
Yes
6. Reading of Lead-in Data
7. Search of First Program

2. Flow of Data (from P.U. to Digital Processor)

There are of quarterly divided photo diodes in the inside of the optical pick-up. A LASER beam reflected back by a disc, is transduced into an electric current by these photo diodes.

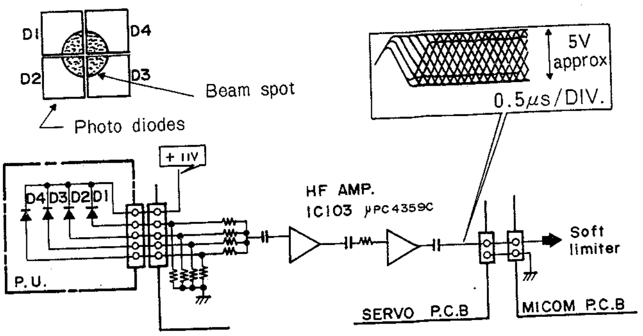

D1
D4
D2
D3
Beam spot
Photo diodes
5V approx
0.5μs/DIV.
+11V
D4 D3 D2 D1
P.U.
HF AMP.
IC103 μPC4359C
Soft limiter
SERVO P.C.B
MICOM P.C.B

Fig. 2-1

2-1. HF Amplifier

The total current of D_1 to D_4 is amplified by IC 103.
This signal is called an 'HF (high frequency) signal', and its circuit is an HF amplifier. A waveform of the HF signal is shown as illustrated, and is called an 'eye-pattern'. The eye-pattern means the waveform itself collected the pits on disc (which have nine different lengths).

2-2. Soft Limiter

The circuit changes the HF signal into a binary coded signal of duty 50%. IC 218 (1/6~3/6, 6/6) is an amplifier composed by inverters, and is making the HF signal into a binary coded signal of 0 or 1.

The converted signal is inverted by passing through an inverter, and is further integrated. Then, it is fed back to the input of the circuit in order to obtain a signal of duty 50%.

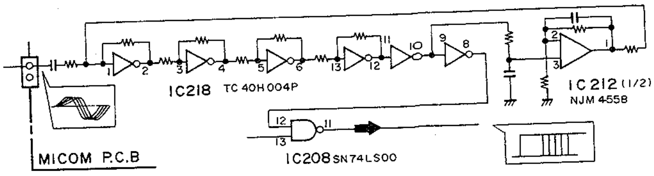

1
2
3
4
5
6
13
12
11
10
9
8
IC218 TC40H004P
2
3
1
IC212 (1/2) NJM4558
12
13
11
IC208 SN74LS00
MICOM P.C.B

Fig. 2-2

2-3. To Digital Processor

The binary coded signal is led to Pin-22 of IC211, AL-800, and is let out from Pin-24 synchronizing with the clock signal (PLCK) of Pin-27. This signal is then changed into an analogue signal by a D/A converter, after it was treated by the digital processor on the C circuit board.

The digital processor is a group of LSIs which performs an EFM modulation, an error detection / correction, a compensation and others, and its detail will be described in 9.

3. Focus Search, Focus Servo

3-1. Focus Servo

The circuit detects a focus error, and supplies the focus coil in the P.U. with an electric current consequently so as to compensate for the error.

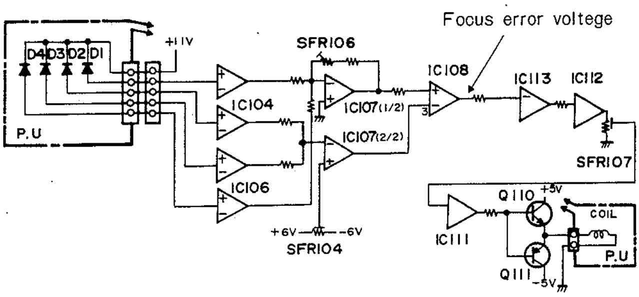
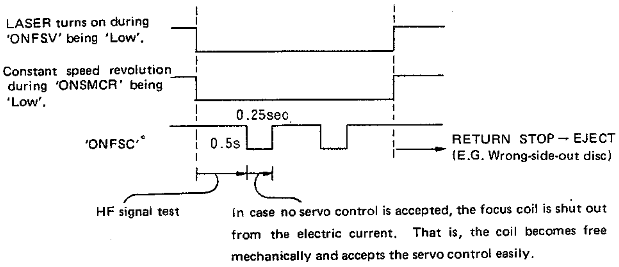

Focus error voltege
D4 D3 D2 D1
P.U
+11V
SFR106
IC104
IC106
IC107(1/2)
IC107(2/2)
IC108
IC113
IC112
SFR107
+6V
-6V
SFR104
IC111
Q110
Q111
+5V
-5V
COIL
P.U

Fig. 3-1

1. IC 104 and IC106 amplify the current of D_1 to D_4.
2. IC 107 (½) amplifies the current of $D_1 + D_4$, while IC 107 (2/2) does $D_2 + D_3$.
3. IC 108 subtracts between the current of $D_1 + D_4$ and the one of $D_2 + D_3$.
4. IC 113, IC 112 and IC 111 amplify the error voltage, and drive Q110 and Q111 to activate the focus coil.

3-2. Focus Search

The circuit turns on and off the focus search signal in order to adjust the focus of the P.V. The time chart of the search is shown as Fig. 3-2.


LASER turns on during 'ONFSV' being 'Low'.
Constant speed revolution during 'ONSMCR' being 'Low'.
'ONFSC'
0.25sec
0.5s
RETURN STOP → EJECT (E.G. Wrong-side-out disc)
HF signal test

In case no servo control is accepted, the focus coil is shut out from the electric current. That is, the coil becomes free mechanically and accepts the servo control easily.

Fig. 3-2

If 'SWHF' turns 'low' during the HF signal test interval, the search goes out of the routine and completes its function.

4. Radial Search, Radial Servo

4-1. Radial Servo

The circuit detects a radial error voltage, and supplies the radial coil in the P.U. with a current consequently so as to trace tracks of disc accurately.

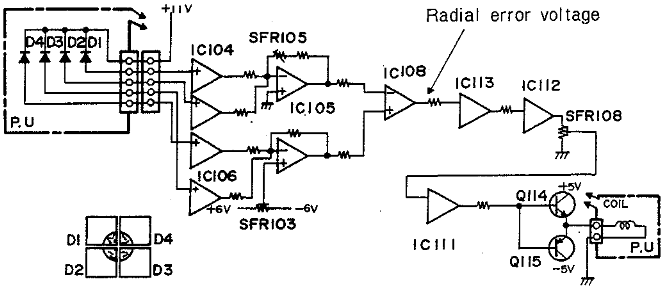

Radial error voltage
+11V
D4 D3 D2 D1
P.U
IC104
SFR105
IC105
IC106
SFR103
+6V
-6V
IC108
IC113
IC112
SFR108
D1
D2
D4
D3
IC111
Q114
Q115
+5V
-5V
COIL
P.U

Fig. 4-1

1. IC 104, IC 106 and IC 105 amplify the current of D_1 to D_4.
2. IC 108 subtracts between the current of $D_1 + D_2$ and the one of $D_3 + D_4$.
3. The error voltage is amplified so that Q 114 and Q115 are driven to activate the radial coil.

4-2. Radial Search (Sample-and-Hold)

An off-set level depends on a disc to be used, because discs have respectively different radial error voltages. Therefore, the circuit adjusts the off-set level in accordance with a disc used, of itself.

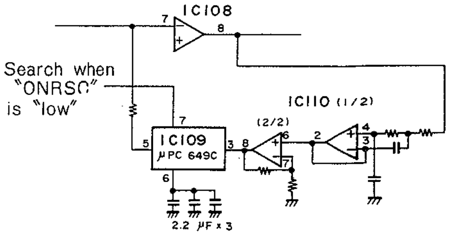

IC108
7
8
Search when "ONRSC" is "low"
IC109
μPC 649C
5
7
6
3
8
IC110 (1/2)
(2/2)
2
4
3
6
7
2.2 μF x 3

Fig. 4-2

The error voltage is changed into a DC voltage by the low-pass filter of IC 110 (½), and after amplified by IC 110 (2/2) it is led to the sample-and-hold IC (IC 109).

During 'ONRSC' being 'low', the output voltage is let out from Pin-5 of IC 109 as it was. It is further led to the inverting input of IC 108 so that it turns the radial error voltage into zero.

The search comes to an end before 'ONRSC' turns 'High'. That is, the voltage which has been applied to Pin-3 of IC 110 is held by three pieces of capacitors of 2.2μF. This held voltage is discharged into Pin-5, consequently.

4-3. Radial Search Compulsion

The radial search is performed when 'ONRSC' turns 'Low'.

During all that time, Q 116 keeps off. So that, an AC current is applied to the inverting input (Pin-3) of IC 111 from the power supply circuit board. Then, the radial coil is driven by the power supply frequency. As soon as the search is completed, Q 116 turns on.

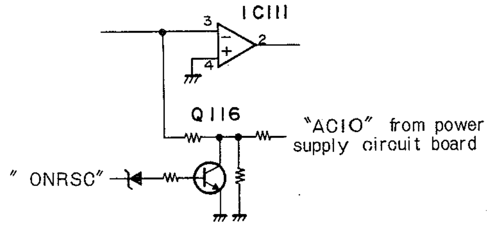

IC111
3
2
4
Q116
"AC10" from power supply circuit board
"ONRSC"

Fig. 4-3

5. APC (Auto Power Control)

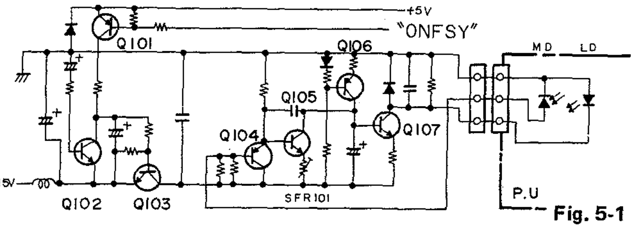

+5V
"ONFSY"
Q101
Q106
MD
LD
Q105
Q104
Q107
-15V
Q102
Q103
SFR101
P.U

Fig. 5-1

The circuit controls the output of the semiconductor LASER.
When an order 'ONFSV' from the system controller turns 'Low', +5V appears at the collector of Q 101 to turn on Q103. Finally, -15V is supplied the APC (auto power control) circuit.

It being assumed that the output of the LD (LASER Diode) increased; It increases the current flowing in the MD (Monitor Diode) with together, and heightens the voltage between the base and the collector of Q 104. So that, the base bias currents of Q 105 is depened to increase the collector current of Q 105. Finally, the base current of Q 107 is reduced because Q 106 is a constant current power supply. It means that the output of the LD is reduced, consequently.

Meanwhile, Q 103 is turned off a moment only by Q 102 turning on when switching power on. This causes the circuit to mute.

6. CM (Carrying Motor) Control Circuit

The inputs of the circuit are;

1. The radial coil voltage
2. +5V (FR, STOP)
3. -5V (at FF)

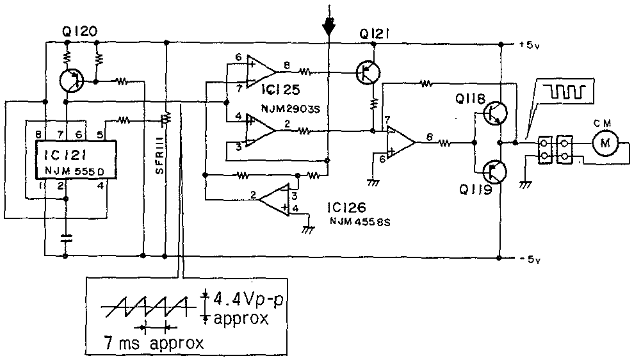

Q120
Q121
+5v
IC125
NJM2903S
Q118
CM
M
IC121
NJM555D
SFR111
Q119
IC126
NJM4558S
-5v
4.4Vp-p
approx
7 ms approx

Fig. 6-1

IC 121 generates a sawtooth wave as illustrated above.
IC 126 is an inverting amplifier and lets out, from Pin-2 of IC 126, a signal having an inverted polarity against the input signal of Pin-3 of IC 125. The signal is further compared with the sawtooth wave by IC 125, – In-phase component is by IC 125 (½).
On the other hand, anti-phase component is by IC 125 (2/2).

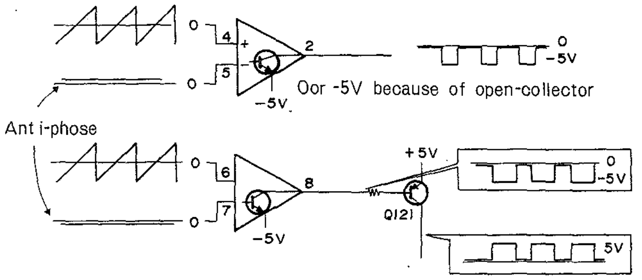

4
5
2
-5V
0
-5V
Oor -5V because of open-collector
Ant i-phose
+5V
6
7
8
Q121
0
-5V
5V

Fig. 6-2

The comparator outputs (Pin-2 of IC 125 and Q 121 collector) are added together and are led to the inverting input of IC 126. After all, the emitter voltage of Q 118 and Q 119 drives the CM.

7. Search

7-1. Kick-pulse Generator Circuit

The circuit releases the radial servo when performing the search, and makes pulses in order to generate the LASER beam.

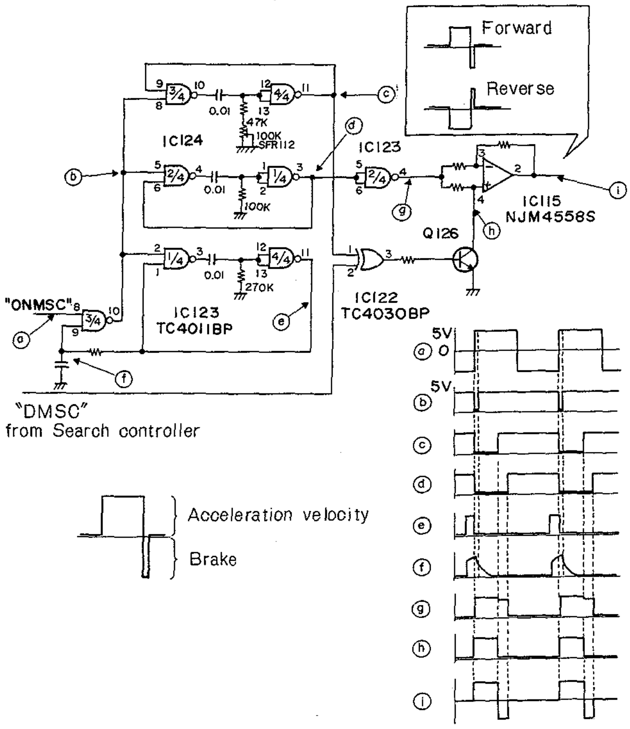

Forward
Reverse
IC124
0.01
47K
100K
SFR112
100K
IC123
IC115
NJM4558S
Q126
270K
"ONMSC"
IC123
TC4011BP
IC122
TC4030BP
"DMSC"
from Search controller
Acceleration velocity
Brake
5V
5V
ⓐ
ⓑ
ⓒ
ⓓ
ⓔ
ⓕ
ⓖ
ⓗ
ⓘ

Fig. 7-1

7-2. Rough Search

A rough search means the way to search by shifting the P.U. along the radius at a high speed.

There is, in the P.U., the chassis (position sensor) of stainless steel plate as shown in Fig. 7-4. The circuit detects the respective slits on the plate by the photo interrupter (LED and photo transistor) so as to shift the P.U.

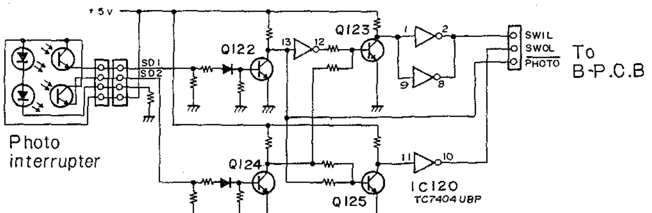

+5V
Q123
Q122
SD1
SD2
SWIL
SWOL
PHOTO
To
B-P.C.B
Photo
interrupter
Q124
Q125
IC120
TC7404UBP

Fig. 7-2

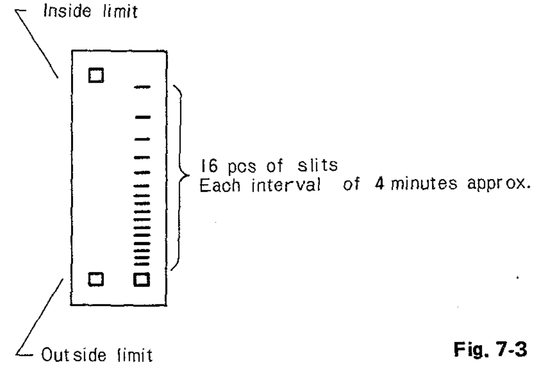

Inside limit
16 pcs of slits
Each interval of 4 minutes approx.
Outside limit

Fig. 7-3

Command / Position	SWIL	SWOL	PHOTO
Inside limit	L	H	H
Outside limit	H	L	L
Slit	H	H	L
Out of slit	H	H	H

Table 7-1

7-2-1. Forward Rough Search

The P.U. moves outwards from the present position at a high speed, until a slit on the chassis (position sensor) is detected. Once stopped, the unit starts reading the data of disc immediately, and judges which search is still needed or not from the data.

Program read when the P.U. stopped

$\leqq$ Desired program − 2 → Forward rough search again
= Desired program − 1 → Forward main search
= Desired program → Pause search
> Desired program → Main search

7-2-2. Reverse Rough Search

The P.U. moves inwards from the present position at a high speed, until a slit on the chassis (position sensor) is detected. Once stopped, the until starts reading the data immediately, and judges which search is still needed or not from the data.

Program read when the P.U. stopped

> Desired program → Reverse rough search again
= Desired program → Pause search
< Desired program → Forward main search

7-3. Main Search

The way of main search is different from the one of rough search. The movement is controlled by crossing a beforehand provided bunch of tracks.

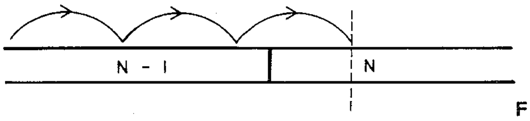


Fig. 7-4

If L is defined as the number of tracks to be initially jumped, the P.U. jumps by L in the radial direction upon a disc in accordance with judgement resulted by the rough search.

Program read at a certain position

< Desired program → Forward main search by L
= Desired program → Pause search
> Desired program → Reverse main search by L/2
L: 64 bunches maximum (192 tracks)

7-4. Track Jump Signal Circuit

The circuit makes a signal from the radial error voltage in order to count jumped tracks.

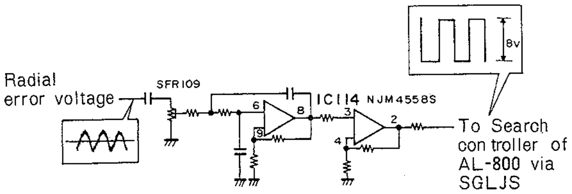


Fig. 7-5

IC114 (2/2) is a low-pass filter, and eliminates the noise component of the radial error voltage. The voltage is further amplified and saturated by IC114 (½) to obtain the track jump signal as shown in Fig. 7-5. AL-800 (IC211) makes 'SGLJS' into a 1/3 frequency, and lets it out to the search controller.

7-5. Pause Search

This search performs a finest movement of the three searches. The movement is controlled by crossing tracks, like the main search.

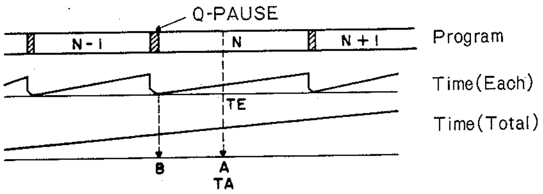


Fig. 7-6

As soon as the main and rough searches are completed at point A, the unit starts calculating the point B.

TA : Total time TE : Each time
α : Off-set time (- 1 second)

That is, TM = TA - TE + α is calculated and memorized. Then, the TM is searched in accordance with the memory.

After crossed the number of the provided tracks, the unit stops to read the data of disc there. Then, it calculates a time difference between the total time and the memorized time TM. To search the desired program again, the number of tracks and the direction to move is resulted from the calculated time difference — big or small, positive or negative.

The pause search is finally completed at a point where TM equals to TA.

A decision of the time difference is given by the way of the following equation ;

T = TA - TM	$\lvert T \rvert \geqq$ 32 seconds	64 bunches of tracks
	$\geqq$ 8 seconds	16 bunches of tracks
	$\geqq$ 2 seconds	3 bunches of tracks
	= 1 second	1 bunch of track
	T > 0	Reverse direction
	< 0	Forward direction

8. PLL (Phase Locked Loop)

8-1. Constant Speed Revolution

After chucking a disc to the turntable, the disc revolves at a constant speed for about three seconds until the PLL mode is set. That is, the SM revolves at a constant speed of 400 r.p.m. approx. by the control of IC 217 which is comparing its inverting input with its non-inverting input.

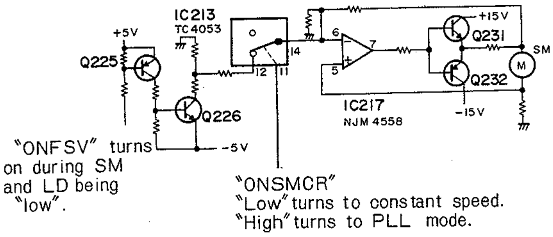

IC213
TC4053
+5V
Q225
Q226
-5V
+15V
Q231
Q232
SM
IC217
NJM 4558
-15V
"ONFSV" turns on during SM and LD being "low".
"ONSMCR"
"Low" turns to constant speed.
"High" turns to PLL mode.

Fig. 8-1

8-2. Speed servo

The speed servo is set until the unit can read the data.

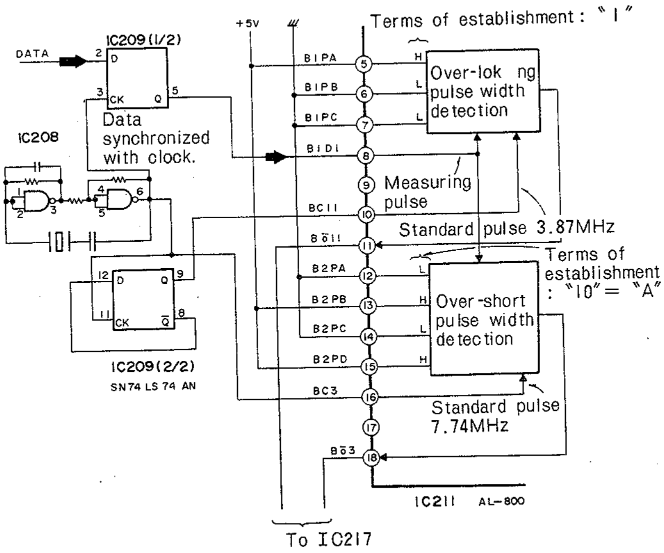

DATA
IC209 (1/2)
D
CK
Q
Data synchronized with clock.
IC208
IC209 (2/2)
SN74 LS 74 AN
+5V
Terms of establishment : "I"
B1PA
B1PB
B1PC
B1Di
BC11
Bō11
B2PA
B2PB
B2PC
B2PD
BC3
Bō3
Over-long pulse width detection
Measuring pulse
Standard pulse 3.87MHz
Terms of establishment : "10" = "A"
Over-short pulse width detection
Standard pulse 7.74MHz
IC211 AL-800
To IC217

Fig. 8-2

The 7.74 MHz oscillator is composed of IC 208 and its associated parts. IC209 (2/2) divides this 7.74 MHz into half, while IC209 (1/2) supplies data synchronizing with the clock signal of 7.74MHz. (IC209 is a dual D-type Flip-Flop.)

Data is led to Pin-8 (BIDi) of IC211 as a measuring pulse. On the other hand, the standard clock pulse of 3.87 MHz is led to Pin-10 (BC11) in order to compare the measuring pulse, and the one of 7.74MHz is led to Pin-16 (BC 3). If the over-long pulse width is detected, the relative pulse is let out from Pin-11 (Bo11). If the over-short pulse width is detected, the pulse is out from Pin-18 (Bo 3) These pulses are changed into inverting or non-inverting pulse for IC217 so as to set the servo.

8-3. Phase Servo

A phase servo is further set.

8-3-1. P.D. (Phase Detector) for Clock ..... PLCK

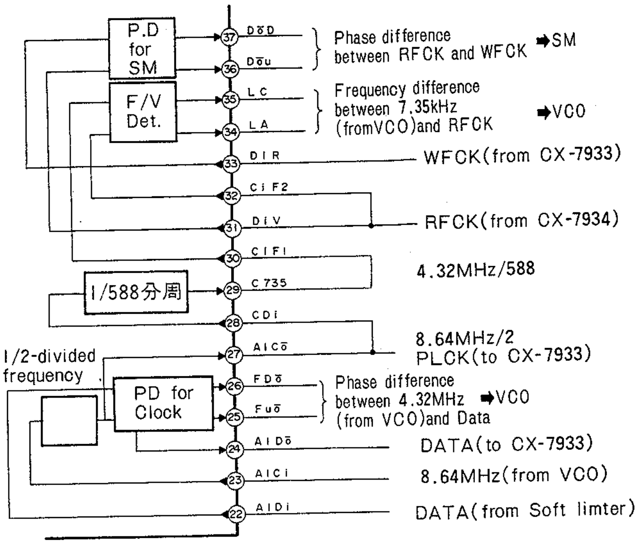

P.D for SM
F/V Det.
1/588分周
PD for Clock
DōD
Dōu
LC
LA
DIR
CiF2
DIV
CIFI
C735
CDi
AICō
FDō
Fuō
AIDō
AICi
AIDi
Phase difference between RFCK and WFCK ➡SM
Frequency difference between 7.35kHz (fromVCO)and RFCK ➡VCO
WFCK(from CX-7933)
RFCK(from CX-7934)
4.32MHz/588
8.64MHz/2
PLCK(to CX-7933)
1/2-divided frequency
Phase difference between 4.32MHz (from VCO)and Data ➡VCO
DATA(to CX-7933)
8.64MHz(from VCO)
DATA(from Soft limter)
IC211 AL-800

Fig. 8-3

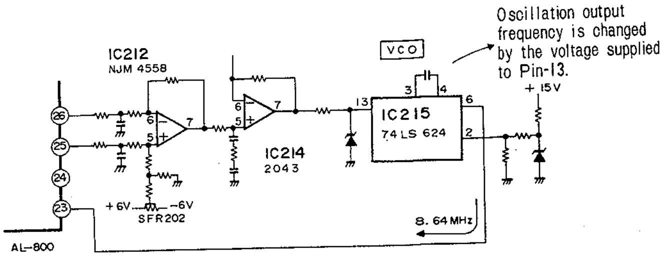

IC212
NJM 4558
VCO
Oscillation output frequency is changed by the voltage supplied to Pin-13.
+15V
IC215
74LS 624
IC214
2043
+6V
-6V
SFR202
8.64MHz
AL-800

Fig. 8-4

CX-7933 reads the data synchronizing with PLCK which is a half-divided frequency of VCO output (8.64 MHz). This PLCK is very important because CX-7933 turns PLCK into WFCK.

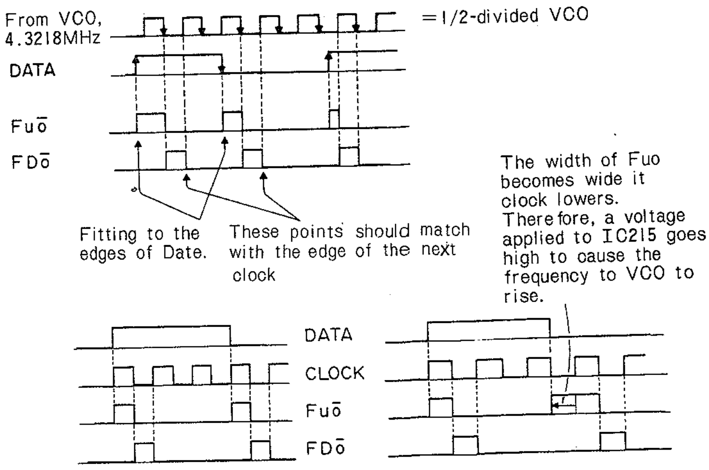

From VCO, 4.3218MHz
=1/2-divided VCO
DATA
Fuō
FDō
Fitting to the edges of Date.
These points should match with the edge of the next clock
The width of Fuo becomes wide it clock lowers. Therefore, a voltage applied to IC215 goes high to cause the frequency to VCO to rise.
DATA
CLOCK
Fuō
FDō

Fig. 8-5

8-3-2. F/V (Frequency / Voltage) Detector

A frequency difference between the divided VCO (7.35kHz) and RFCK is led to LC and LA as the relative pulse. The FET Q229 is a constant current power supply.

IC214 (1/2) is an integrator, and generates a DC from its output when detecting the frequency difference between the two.

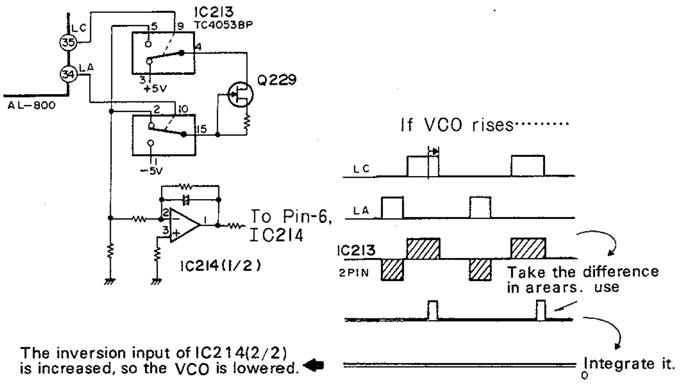

IC213
TC4053BP
LC
LA
35
34
AL-800
+5V
-5V
Q229
To Pin-6, IC214
IC214(1/2)
If VCO rises·········
LC
LA
IC213
2PIN
Take the difference in arears. use
Integrate it.
0
The inversion input of IC214(2/2) is increased, so the VCO is lowered.

Fig. 8-6

8-3-3. SM (Spindle Motor)

The SM is driven by the driver circuit (Q227, Q228 and IC217) and the driver transistors (Q231 and Q232), after detected a phase difference between RFCK and WFCK.

RFCK: A clock signal which is made from the crystal of 8.64 MHz (on the C circuit board). This is used for reading the data from the memory.

WFCK: A clock signal which is made from PLCK. This synchronizes with the data of disc and writes the data in the memory.

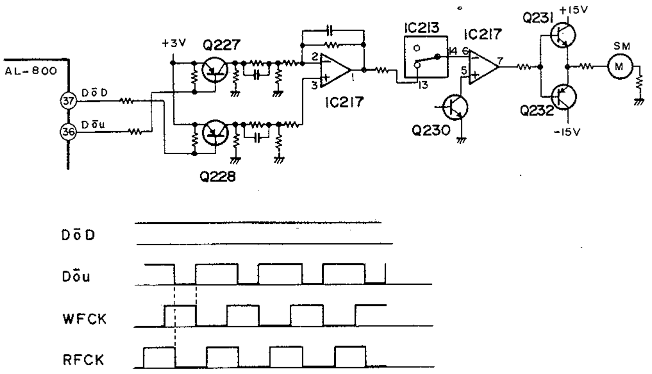

AL-800
+3V
Q227
Q228
DōD
Dōu
37
36
IC213
IC217
Q231
Q232
Q230
+15V
-15V
SM
M
DōD
Dōu
WFCK
RFCK

Fig. 8-7

8-3-4. PLL Lock Judgement

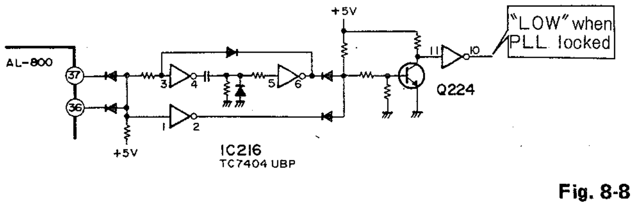

AL-800
37
36
+5V
+5V
IC216
TC7404 UBP
Q224
"LOW" when PLL locked

Fig. 8-8

When the PLL is set, Pin-10 of IC217 turns 'low'. If released, it turns 'high'. That is, Q233 and Q234 turn off to set the speed servo, if the PLL released. The width of pulse occurring at Pin-6 of IC216 is fixed because IC216 (2/6, 3/6) is consist of a one-shot multi-vibrator. On the other hand, at Pin-2 occurs a signal generated by detection of phase difference between RFCK and WFCK. That is, it may be varied by the width of DoD and Dou pulses. The 'high' part of the pulse width at Pin-2 becomes gradually long, if the PLL is nearly released. This port is further added by the signal at Pin-6 to cause Q224 to turn on. If Q224 turns on, the unit judges that the PLL is released.

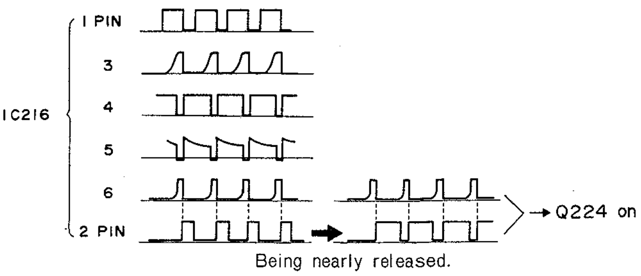

IC216
1 PIN
3
4
5
6
2 PIN
Q224 on
Being nearly released.

Fig. 8-9

9. Digital Processor

The block diagram is shown in Fig. 9-1.

CX-7933 generates a parallel data of eight bits of EFM modulation in accordance with a command of 'DENB : Let out data' from CX-7934. Meanwhile, it requires to let out a command of 'WREQ : Write into the external RAM, IC 304 TMM2016P', of CX-7934. An address to the external RAM is designated by CX-7934. Then, the data is written into the external RAM.

In accordance with a command of 'PREN : Start the program' from CX-7934, the data from the external RAM is let into CX-7935 to calculate an error detection and correction. CX-7935 orders the external RAM an address, via CX-7934. Furthermore, the data from CX-7935 is written into the external RAM once, and is let into CX-7934. During all this time, the deinterleave is performed. CX-7934 compensates for the data and let out a parallel data of sixteen bits to the D/A converter.

The dejitter circuit is enclosed in there and eliminates an interference from the jitter.

IC BLOCK DIAGRAM

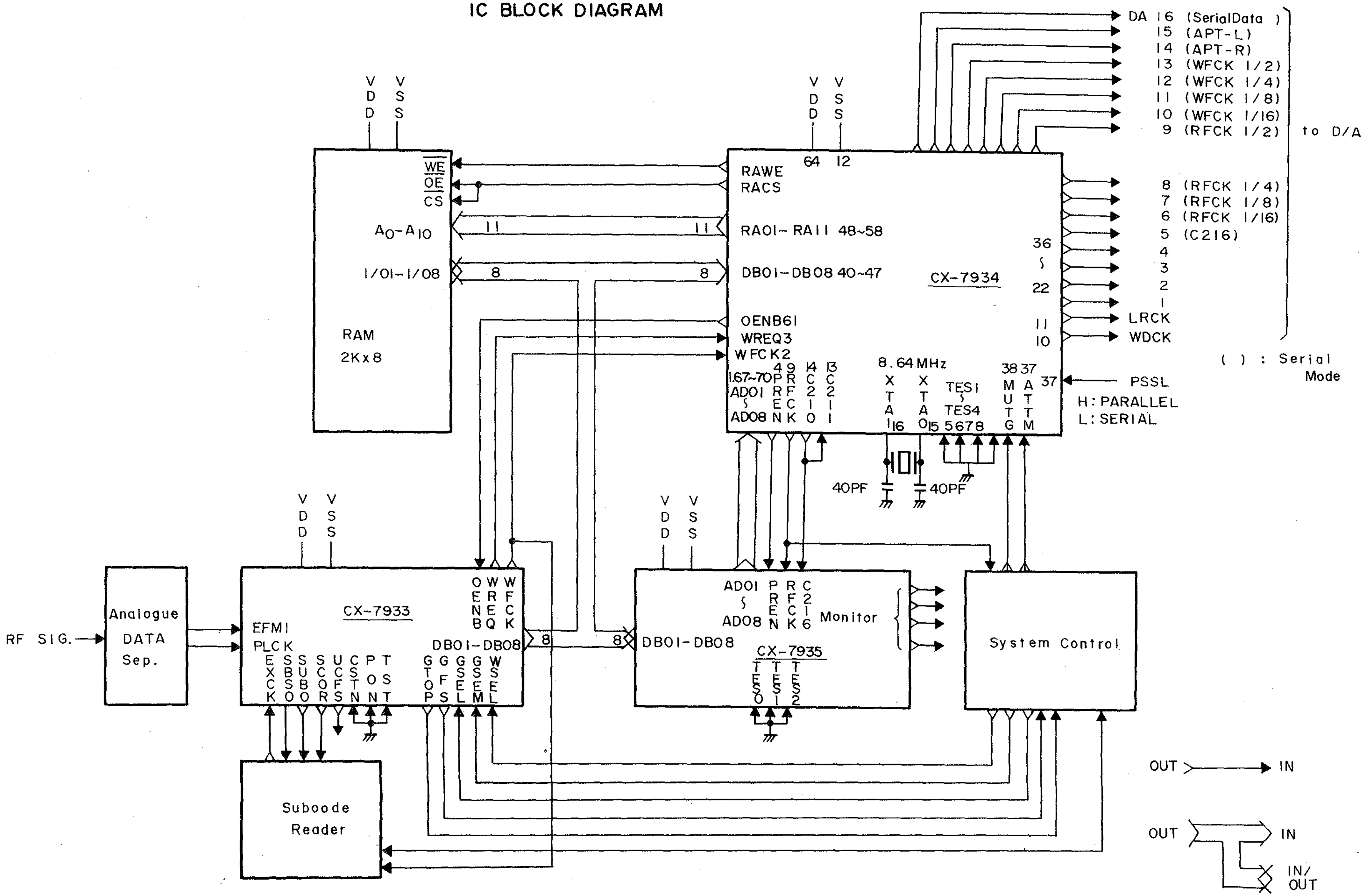

RAM
2Kx8
WE
OE
CS
A0-A10
I/01-I/08
VDD
VSS
11
8
CX-7934
RAWE
RACS
RA01-RA11 48~58
DB01-DB08 40~47
OENB61
WREQ3
WFCK2
1.67~70 ADO1 ∫ ADO8
49 PRENK
14 C2IO
13 C2I1
8.64MHz
XTAI 16
XTAO 15
TES1 ∫ TES4 5678
38 MUTG
37 ATTM
64
12
36 ∫ 22
11
10
37
PSSL
H: PARALLEL
L: SERIAL
DA 16 (SerialData)
15 (APT-L)
14 (APT-R)
13 (WFCK 1/2)
12 (WFCK 1/4)
11 (WFCK 1/8)
10 (WFCK 1/16)
9 (RFCK 1/2)
8 (RFCK 1/4)
7 (RFCK 1/8)
6 (RFCK 1/16)
5 (C216)
4
3
2
1
LRCK
WDCK
to D/A
( ) : Serial Mode
40PF
40PF
RF SIG.
Analogue DATA Sep.
CX-7933
EFM1
PLCK
EXCK
SBSO
SUBO
SCOR
UCFS
CSTN
PON
TST
GTOP
GFS
GSEL
GSEM
WSEL
OENB
WREQ
WFCK
DB01-DB08
8
Suboode Reader
CX-7935
ADO1 ∫ ADO8
PREN
RFCK
C2I6
Monitor
DB01-DB08
TESO
TES1
TES2
System Control
OUT → IN
OUT → IN
IN/OUT

Fig. 9-1

10. Audio Amplifier Circuit

The output of the DAC (D/A Converter) appears as Pin-17 of IC305, PCM53JG, and is divided into two channels – left and right channels – by the analogue switch IC313, TC4053BP.

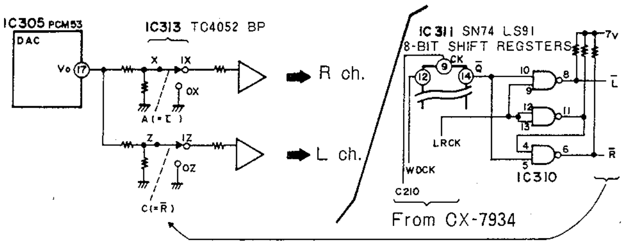

IC305 PCM53
DAC
Vo 17
IC313 TC4052 BP
X
IX
OX
A(=L)
Z
IZ
OZ
C(=R)
R ch.
L ch.
IC311 SN74 LS91
8-BIT SHIFT REGSTERS
CK
Q̄
12
9
14
10
8
12
11
13
4
6
5
LRCK
WDCK
C210
L̄
R̄
IC310
From CX-7934
7V

Fig. 10-1

C210, WDCK and LRCK are the clock signals from CX-7934 and the frequencies are defined as 2.16MHz, 88.2 kHz, and 44.1 kHz respectively. L̄ and R̄ are obtained by the clock signals, the shift registor and such so as to turn on the switch of IC313. The time chart is shown in Fig. 10-3.

CONTROL INPUTS				"ON" CHANNEL
INHIBIT	C	B	A	TC4053BP
L	L	L	L	0X, 0Y, 0Z
L	L	L	H	1X, 0Y, 0Z
L	L	H	L	0X, 1Y, 0Z
L	L	H	H	1X, 1Y, 0Z
L	H	L	L	0X, 0Y, 1Z
L	H	L	H	1X, 0Y, 1Z
L	H	H	L	0X, 1Y, 1Z
L	H	H	H	1X, 1Y, 1Z
H	*	*	*	NONE

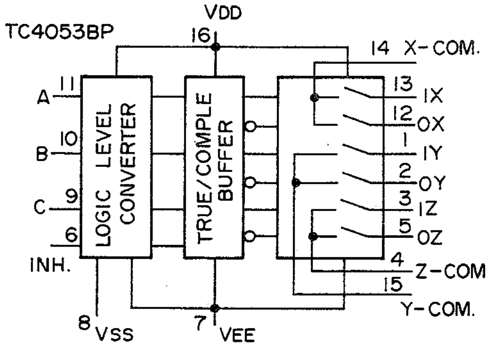

TC4053BP
VDD
16
14 X-COM.
A 11
B 10
C 9
6
INH.
LOGIC LEVEL CONVERTER
TRUE/COMPLE BUFFER
13 IX
12 OX
1 IY
2 OY
3 IZ
5 OZ
4 Z-COM
15 Y-COM.
8 VSS
7 VEE

Fig. 10-2

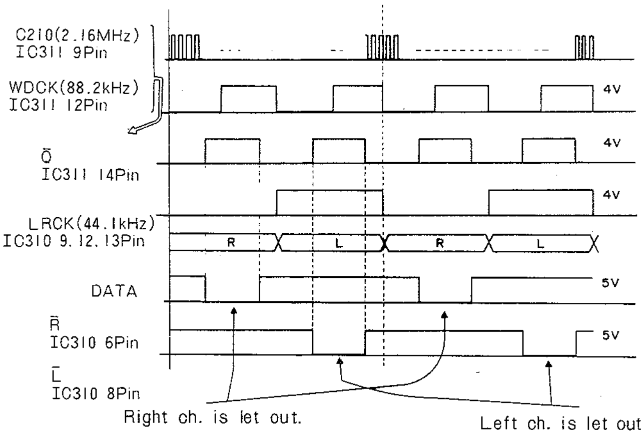
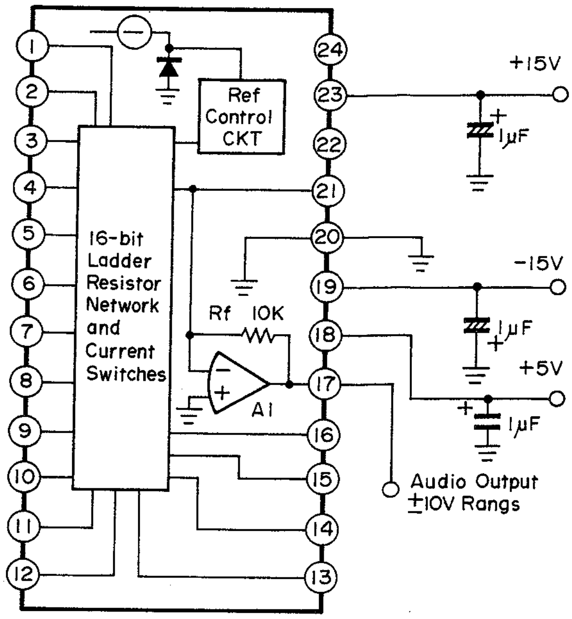


Fig. 10-3


1
2
3
4
5
6
7
8
9
10
11
12
24
23
22
21
20
19
18
17
16
15
14
13
Ref Control CKT
16-bit Ladder Resistor Network and Current Switches
Rf 10K
A1
+15V
1μF
-15V
1μF
+5V
1μF
Audio Output ±10V Rangs

PCM53JG

Pin No.	PCM53JG-V
1	Bit 1 (MSB)
2	Bit 2
3	Bit 3
4	Bit 4
5	Bit 5
6	Bit 6
7	Bit 7
8	Bit 8
9	Bit 9
10	Bit 10
11	Bit 11
12	Bit 12
13	Bit 13
14	Bit 14
15	Bit 15
16	Bit 16 (LSB)
17	±10V AUDIO OUT (PCM53)
18	+5 VDC
19	-15 VDC
20	COMMON
21	SUMMING JUNCTION
22	TEST POINT
23	+15 VDC
24	TEST POINT

Fig. 10-4

FUNCTION TABLE			
INPUTS		OUTPUTS	
ATt_n		ATt_{n+8}	
A	B	Q_H	$\bar{Q}_H$
H	H	H	L
L	X	L	H
X	L	L	H

H = high, L = low
X = irrelevant
t_n = Reference bit time, clock low
t_{n+8} = Bit time after 8 low-to-high clock transitions

SN74LS91 (J,N)

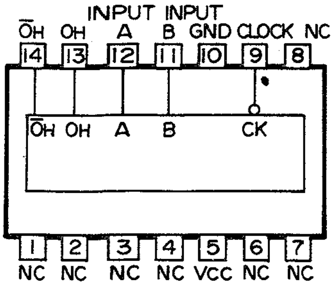
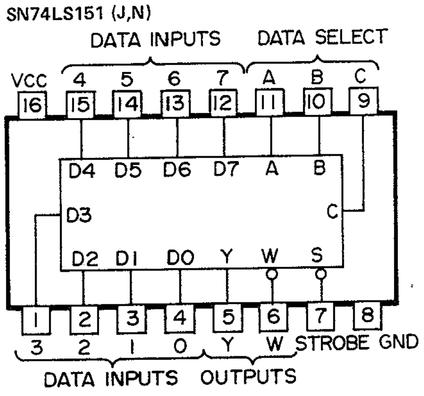

Q̄H QH INPUT A INPUT B GND CLOCK NC
14 13 12 11 10 9 8
Q̄H QH A B CK
1 2 3 4 5 6 7
NC NC NC NC VCC NC NC

Fig. 10-5

11. Key Circuit

IC401 and IC402, SN74LS151N single out one data from eight data. One of D0 ~ D7 is let out to Y (Pin-5) by the select signals of KSELϕ(A), KSEL1(B) and KSEL2(C) from the micro-computer (system controller).


SN74LS151 (J,N)
DATA INPUTS
DATA SELECT
VCC
4 5 6 7 A B C
16 15 14 13 12 11 10 9
D4 D5 D6 D7 A B
D3
C
D2 D1 D0 Y W S
1 2 3 4 5 6 7 8
3 2 1 0 Y W STROBE GND
DATA INPUTS
OUTPUTS

INPUTS				OUTPUTS	
SELECT			STROBE	Y	W
C	B	A	S		
X	X	X	H	L	H
L	L	L	L	D0	$\overline{D0}$
L	L	H	L	D1	$\overline{D1}$
L	H	L	L	D2	$\overline{D2}$
L	H	H	L	D3	$\overline{D3}$
H	L	L	L	D4	$\overline{D4}$
H	L	H	L	D5	$\overline{D5}$
H	H	L	L	D6	$\overline{D6}$
H	H	H	L	D7	$\overline{D7}$

Fig. 11-1

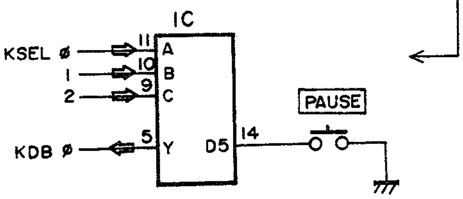
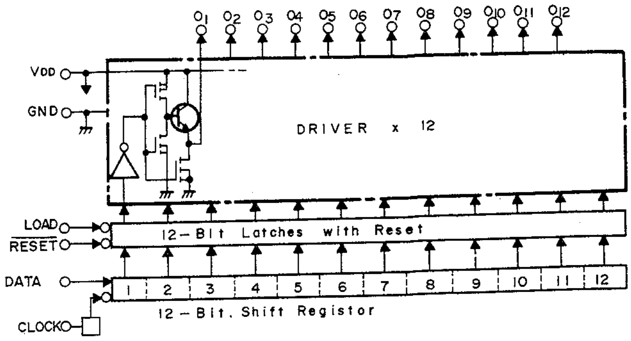

IC
KSEL ϕ
1
2
11
10
9
A
B
C
KDB ϕ
5
Y
D5
14
PAUSE

Fig. 11-2

It being assumed that you pressed the PAUSE button, and the moment of 'H' at A, 'L' at B and 'H' at C was formed. It causes the output Y to turn 'low', and this becomes a command for the system controller to perform the PAUSE function.

12. Display Circuit

IC403, MSM58371RS builds a shift register, a latch and a driver of twelve bits in itself, and converts a serial data of twelve bits into a parallel data so as to turn on LEDs.


O1 O2 O3 O4 O5 O6 O7 O8 O9 O10 O11 O12
VDD
GND
DRIVER x 12
LOAD
RESET
12-Bit Latches with Reset
DATA
1 2 3 4 5 6 7 8 9 10 11 12
CLOCK
12-Bit. Shift Register

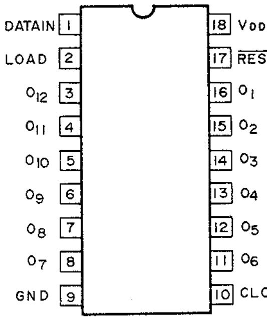

DATAIN 1
LOAD 2
O12 3
O11 4
O10 5
O9 6
O8 7
O7 8
GND 9
18 VDD
17 RESET
16 O1
15 O2
14 O3
13 O4
12 O5
11 O6
10 CLOCK

Fig. 12-1

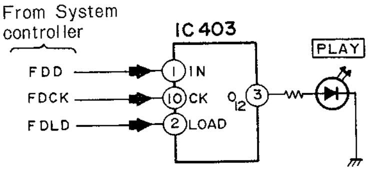
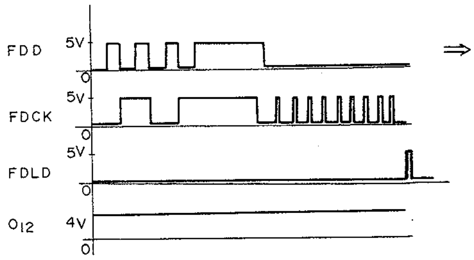

From System controller
FDD
FDCK
FDLD
IC 403
1 IN
10 CK
2 LOAD
O12 3
PLAY

Fig. 12-2

A serial data of twelve bits which is dispatched from the system controller (FDD), is picked up by both the clock (FDCK) and load (FDLD) signals if a command of 'display PLAY' is set. There fore, Pin-3 comes to about 4V and its waveform is shown in Fig. 12-3.



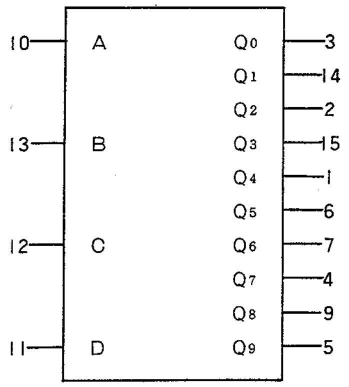
⇒ Twelve data is put serially in Ovdet as PLAY, PAUSE,·········

Fig. 12-3

IC451, MSM59371RS works the same as IC403, except that data of sixteen bits is let in. The data of the search controller causes the sixteen LEDs for TRACK No. to turn on and flash on/off in accordance with a command of this IC.

IC407, TC4028BP is a decoder which converts BCD signal into decimal number signal.

BLOCK DIAGRAM


10
A
13
B
12
C
11
D
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
3
14
2
15
1
6
7
4
9
5

VDD ; 16V, Vss ; 3V

TRUTH TABLE

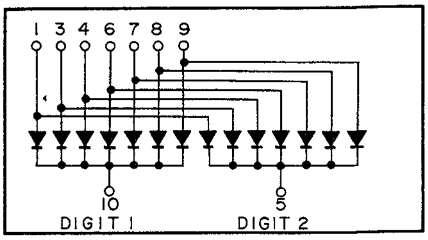
INPUTS				SELECTED OUTPUT "H"
D	C	B	A	
L	L	L	L	Q0
L	L	L	H	Q1
L	L	H	L	Q2
L	L	H	H	Q3
L	H	L	L	Q4
L	H	L	H	Q5
L	H	H	L	Q6
L	H	H	H	Q7
H	※	※	L	Q8
H	※	※	H	Q9

※ Don't care

Fig. 12-4

TG322

PIN No.		
1	G	ANODE
2	NO PIN	
3	A	ANODE
4	F	ANODE
5	DIGIT 2	COMMON CATHODE
6	D	ANODE
7	E	ANODE
8	C	ANODE
9	B	ANODE
10	DIGIT 1	COMMON CATHODE


1 3 4 6 7 8 9
10
DIGIT 1
5
DIGIT 2

TRACK NO.

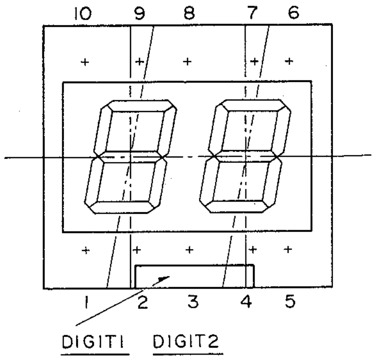

10
9
8
7
6
1
2
3
4
5
DIGIT1
DIGIT2

Fig. 12-5

TIME DISPLAY

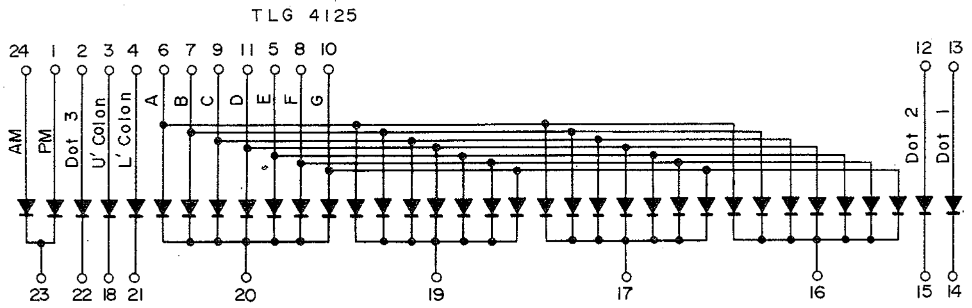
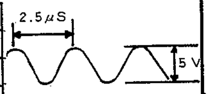

TLG 4125
24 1 2 3 4 6 7 9 11 5 8 10
12 13
AM
PM
Dot 3
U' Colon
L' Colon
A
B
C
D
E
F
G
Dot 2
Dot 1
23
22
18
21
20
19
17
16
15
14

Fig. 12-6

■ System Controller : IC203 LM6402A-152

Pin No.	Pin Name	Type	Contents
1.	X'tal	–	Terminal at which an external oscillation circuit is installed, for built-in clock oscillator.
2. 3.	EMFWD EMREV	OUT OUT	Output terminals of normal and reverse revolution control signal for Elevation Motor.

EMFWD	EMREV	E.M.
L	H	To turn so as to lift up the elevator.
H	L	To turn so as to bring down the elevator.
H	H	To turn off



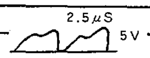
Pin No.	Pin Name	Type	Contents
4.	ONFSC	OUT	Its 'Low' output turns on Focus Search.
5.	ONRSC	OUT	Its 'Low' output turns on Radial Search.
6.	INT	IN	Input terminal for requirement of interruption.
7.	RES	IN	Input terminal for reset.
8.	ONCM	OUT	It 'Low' output turns on Carrying Motor.
9.	ONRMT	OUT	Its 'High' output turns on Radial Mute.
10.	ONCMH	OUT	Its 'High' output turns Carrying Motor into high speed mode. Its 'Low' output turns it into Radial Servo mode.
11.	DCMSY	OUT	Its 'Low' output turns Carrying Motor outwards. Its 'High' output turns it inwards.
12. 13. 14. 15. 16.	SRPAS SRREV SRFWD – SRCMEM	OUT OUT OUT – OUT	Terminals for Search Micro-computer Controller.

SRCMEM	SRFWD	SRREV	SRPAS	Function of Search Controller
–	L	L	L	No operation
–	L	L	H	To carry out PAUSE.
L	L	H	L	To perform search of one program reversewards.
L	L	H	H	To continue to perform rough search reversewards.
L	H	L	L	To perform search of one program forwards.
L	H	L	H	To continue to perform rough search forwards.
L	H	H	L	To perform search of first program after reset or loaded a disc.
–	H	H	H	To interrupt functions.
H	L	H	L	To perform search of one memory program reversewards.
H	L	H	H	To let out EJECT signal
H	H	L	L	To perform search of one memory program forwards.
H	H	L	H	No operation
H	H	H	L	To let out RETURN signal

Pin No.	Pin Name	Type	Contents
17.	MINC	OUT	Output terminal for MEMORY INC key.
18.	MSET	OUT	Output terminal for MEMORY SET key.
19.	MCLR	OUT	Output terminal for MEMORY CLEAR key.
20.	TEST	–	Terminal to be usually connected to Vss.
21.	Vss	–	Ground
22.	ONSMCR	OUT	Its 'Low' output turns Spindle Motor into a constant speed revolution. Its 'High' output turns it into PLL mode.
23.	ONFSV	OUT	Its 'Low' output turns on Spindle Motor and LASER Diode.
24.	SGPO	IN	Input terminal for PLL lock-on signal. Its 'Low' input turns to PLL set. From CX-7933, 'GFS'.
25.	ONAMT	OUT	Its 'High' output turns on Analogue Mute.
26. 27. 28.	KSEL 0 KSEL 1 KSEL 2	OUT OUT OUT	Output terminals for Select signal of eight to one Data Selector.
26. 27. 29.	FDD FDCK FDLD	OUT OUT OUT	Output terminal for Port Expander Data signal Output terminal for Port Expander Clock signal Output terminal for Port Expander Load signal } Display signals
30.	FERR	OUT	Its 'high' output displays 'OPER'.
31. 32.	DCOM 0 DCOM 1	OUT OUT	Output terminals for seven-segment switch signals.

DCOM 1	DCOM 0	Seven-Segment LED Display
L	L	To display lapse of time every one program.
L	H	To display absolute time.
H	L	To display of being returning.
H	H	To display operation error.

Pin No.	Pin Name	Type	Contents
33. 34. 35. 36.	KDB 0 KDB 1 KDB 2 KDB 3	IN IN IN IN	Ports for input only. Input Data Bus. (33, 34) From Display / Key P.C.B. (35, 36) From B P.C.B.

<table>
<tr><th>Pin No.</th><th>Pin Name</th><th>Type</th><th>Contents</th></tr>
<tr><td>37.
38.</td><td>LMFWD
LMREV</td><td>OUT
OUT</td><td>Output terminals of normal and reverse revolution control signal for Loading Motor.
<table>
<tr><th>LMFWD</th><th>LMREV</th><th>L.M.</th></tr>
<tr><td>L</td><td>H</td><td>To turn so as to load in.</td></tr>
<tr><td>H</td><td>L</td><td>To turn so as to eject.</td></tr>
<tr><td>H</td><td>H</td><td>To turn off</td></tr>
</table></td></tr>
<tr><td>39.</td><td>DS</td><td>OUT</td><td>No operation. Output terminal for Disc solenoid control.</td></tr>
<tr><td>40.</td><td>TS</td><td>OUT</td><td>Output terminal of solenoid control for Tray-lock release.</td></tr>
<tr><td>41.</td><td>VDD</td><td>—</td><td>+5V power supply.</td></tr>
<tr><td>42.</td><td>Extal</td><td>—</td><td>Terminal to operate by supplying clock signal from external.  </td></tr>
</table>

OUT : OUTPUT, IN : INPUT

■ Subcode Reader Micro-computer : IC205 HD6805S1-A10

Pin No.	Pin Name	Type	Contents
1.	**Vss**	—	Ground
2.	**$\overline{INT}$**	IN	WFCK from CX-7933
3.	**Vcc**	—	+5V power supply
4.	**X_T**	IN	Clock (CX2ō) from AL-800.
5.	**EX_T**	—	Ground
6.	**NUM**	—	Ground
7.	**TMR**	—	+5V
8.	**DG 0**	OUT	Display reed signal and transmission clock.
9.	**DG 1**	OUT	
10.	**DG 2**	OUT	
11.	**DCOM 0**	IN	Absolute time, 'High' during operation error.
12.	**STLI**	OUT	'High' by read-in
13.	**STLO**	OUT	'High' by read-out
14.	**STPAS**	OUT	'High' during Q-PAUSE
15.	**SUBSTA**	OUT	Transmission synchronization signal — Pulse to be generaled when subcode is correct after reading.
16.	**ONDEP**	OUT	'High' during being emphasized
17.	**DCOM 1**	IN	'High' during RETURN and Operation Error.
18.	**SCOR**	IN	Synchronization signal } from CX-7933.
19.	**SUBQ**	IN	Q data
20.	**SEG A (DSUB0)**		Display data and transmission data
21.	**B (DSUB1)**		
22.	**C (DSUB2)**		
23.	**D (DSUB3)**		
24.	**E (DSUB4)**		
25.	**F (DSUB5)**		
26.	**G (DSUB6)**		
27.	**(DSUB7)**		
28.	**RSET**	IN	'High' during PLAY.

OUT : OUTPUT, IN : INPUT

■ Search Micro- computer : IC204, HD8605U1-A08

Pin No.	Pin Name	Type	Contents
1.	Vss	–	Ground
2.	$\overline{\text{RES}}$	IN	'High' during PLAY. Input terminal for RESET.
3.	$\overline{\text{INT}}$	IN	Input terminal for requirement of interruption.
4.	Vcc	–	+5V power supply
5.	XTAL	–	Clock (CX $2\overline{o}$) signal from AL-800
6.	EXTAL	–	Ground
7.	NUM	–	Ground
8.	TIMER	–	+5V
9.	MCLR	IN	Signals for each memory key, being let in from system controller. 'High' when pressing each key.
10.	MSET	IN	
11.	MINC	IN	
12.	SWIL	IN	'Low' by Inside limit.
13.	SRPAS	IN	Control signal for search, from system controller. * Refer to system controller for its logic.
14.	SRREV	IN	
15.	SRFWD	IN	
16.	SRCMEM	IN	
17.	DSUB7	IN	Subcode data generated from Subcode reader
18.	DSUB6	IN	
19.	DSUB5	IN	
20.	DSUB4	IN	
21,	DSUB3	IN	
22.	DSUB2	IN	
23.	DSUB1	IN	
24.	DSUB0	IN	
25.	STEM 1	OUT	'High' by error detection in last memory program. To system controller.
26.	STEM 0	OUT	'High' by error detection of empty memory.
27.	BUSY	OUT	'High' when receiving a command.
28.	DMNLD	OUT	Data To each signal display circuit for serially parallel control (Sixteen LEDs)
29.	DMNCK	OUT	Clock
30.	DMND	OUT	Load
31.	SUBSTA	IN	Subcode start
32.	MUSEND	OUT	A pulse is generated every an increment of program forwards (in advance).
33.	SUBP	IN	'High' during P-PAUSE signal
34.	SWHF	IN	HF signal. 'Low' when HF signal occurs.
35.	PHOTO	IN	'Low' by slit.
36.	DCMSC	OUT	Direction of rough search. 'Low' when forward, and 'High' when reverse.
37.	ONCS	OUT	Rough search on/off. Its 'High' output turns it on.
38.	CMSVN	OUT	Rough search speed. Its 'High' output turns into a high speed.
39.	DMSC	OUT	Direction of Main PAUSE search. 'Low' when forward, and 'High' when reverse.
40.	ONMSC	OUT	Main PAUSE search on/off. Its 'High' output turns it on.

OUT : OUTPUT, IN : INPUT

■ CX-7933, IC301

Pin No.	Pin Name	Type	Contents
1.	**GFS**	OUT	Lock display
2.	**GTOP**	OUT	Display of frame synchronization protection condition
3.	**GSEL**	IN	Watch of selection of frame number, L
4.	**GSEM**	IN	Watch of selection of frame number, M
5.	**WSEL**	IN	Window selection
6.	**CSIN**	IN	No operation
7.	**PON**	IN	
8.	**Vss**	–	Ground
9.	**TST**	IN	No operation
10.	**UGFS**	OUT	Must be open
11.	**EXCK**	IN	Clock signal for subcode serial output.
12.	**SBSO**	OUT	Subcode serial output
13.	**SUBQ**	OUT	Subcode Q output
14.	**SCOR**	OUT	Q data synchronization signal
15.	**WFCK**	OUT	Signal of 'write frame clock'
16.	**WREQ**	OUT	Signal of 'write request'
17.	**DB01**	OUT	Data 1 (LSB)
18.	**DB02**	OUT	Data 2
19.	**DB03**	OUT	Data 3
20.	**DB04**	OUT	Data 4
21.	**DB05**	OUT	Data 5
22.	**VDD**	–	+5V power supply
23.	**DB06**	OUT	Data 6
24.	**DB07**	OUT	Data 7
25.	**DB08**	OUT	Data 8 (MSB)
26.	**DENB**	IN	Data enable output
27.	**PLCK**	IN	PLL clock signal
28.	**EFMI**	IN	EFM signal

OUT : OUTPUT, IN : INPUT

Functions :

1. EFM data demodulation
2. Subcode signal demodulation
3. Frame synchronization signal detection, and protection against dropout.
4. Interface signal generation.

■ CX-7934, IC302

Pin No.	Pin Name	Type	Contents
1.	AD01	IN	Input terminal to let in address and control signals from CX-7935.
2.	WFCK	IN	Input terminal to let in signal of 'write frame clock' from CX-7933.
3.	WREQ	IN	Input terminal to let in signal of 'write request for RAM' from CX-7933.
4.	PREN	OUT	Output terminal to let out signal which enables to read/write with external RAM, into CX-7935.
5.	TES 4	IN	Vss usually
6.	TES 3	IN	
7.	TES 1	IN	
8.	TES 2	IN	
9.	RFCK	OUT	Output terminal to let out signal of 'read frame clock' into CX-7935.
10.	WDCK	OUT	Output terminal to let out strobe signal of 88.2kHz.
11.	LRCK	OUT	Output terminal to let out strobe signal of 44.1kHz.
12.	Vss	–	
13.	C210	OUT	Output terminal to let out clock signal of 2.16 MHz after divided 8.64 MHz.
14.	C211	IN	Input terminal to let in clock signal of 2.16 MHz which is let out from C210.
15.	XTAO	OUT	Output terminal of 8.64 MHz oscillator circuit.
16.	XTAI	IN	Input terminal of 8.64 MHz oscillator circuit.
17.	DA16	OUT	Output terminals to let out parallel data of sixteen bits into D/A converter.
18.	NC	–	
19.	DA 15	OUT	
20.	DA 14	OUT	
21.	NC	–	
22.	DA 13	OUT	
23.	DA 12	OUT	
24.	DA 11	OUT	
25.	DA 10	OUT	
26.	DA09	OUT	
27.	DA08	OUT	
28.	DA07	OUT	
29.	DA06	OUT	
30.	Vss	–	
31.	NC	–	
32.	DA05	OUT	
33.	DA04	OUT	
34.	DA03	OUT	
35.	DA02	OUT	
36.	DA01	OUT	
37.	PSSL	IN	Terminal to control the way to let out data (parallel / serial) into D/A converter.
38.	MUTG	IN	Input terminal to perform mute.
39.	ATTM	IN	Input terminal to attenuate data 12 dB down into D/A converter.
40.	DB08	IN	Input terminals for parallel data of eight bits from external RAM.
41.	DB07	IN	
42.	DB06	IN	
43.	DB05	IN	
44.	DB04	IN	
45.	DB03	IN	
46.	DB02	IN	
47.	DB01	IN	
48.	RA 01	OUT	Terminals to let out addresses of external RAM.
49.	RA 02	OUT	
50.	RA03	OUT	
51.	RA04	OUT	
52.	RA05	OUT	
53.	RA06	OUT	
54.	RA07	OUT	
55.	RA08	OUT	
56.	RA09	OUT	
57.	RA 10	OUT	
58.	RA 11	OUT	
59.	RACS	OUT	Terminal to let out chip select signal of external RAM.
60.	RAWE	OUT	Terminal to let out signal of 'write enable' of external RAM.
61.	OENB	OUT	Terminal to let out signal of 'output enable' into CX-7933.
62.	AD08	IN	Input terminals to let in address and control signals from CX-7935.
63.	AD07	IN	
64.	VDD	–	+5V power supply
65.	NC	–	
66.	AD-06	IN	
67.	AD-05	IN	
68.	AD-04	IN	
69.	AD-03	IN	
70.	AD-02	IN	

OUT : OUTPUT, IN : INPUT

Functions :

1. Read / write control of external RAM.
2. Average value compensation.
3. Interface signal generation with D/A converter.
4. CLV (constant linear velocity) standard signal generation.

■ CX-7935, IC305

Pin No.	Pin Name	Type	Contents
1.	**DB06**	IN/OUT	Data bus of eight bits.
2.	**DB05**	IN/OUT	
3.	**DB04**	IN/OUT	
4.	**DB03**	IN/OUT	
5.	**DB02**	IN/OUT	
6.	**DB01**	IN/OUT	
7.	**TES0**	IN	Vss usually
8.	**Vss**	–	Ground
9.	**TES 1**	IN	Vss usually
10:	**TES 2**	IN	
11.	**C1F1**	OUT	No operation
12.	**C1F2**	OUT	
13.	**C2F1**	OUT	
14.	**C2F2**	OUT	
15.	**C216**	IN	Clock signal from CX-7934
16.	**RFCK**	IN	RFCK from CX-7934
17.	**PREN**	IN	Program enable from CX-7934
18.	**AD01**	OUT	Addresses and pointers
19.	**AD02**	OUT	
20.	**AD03**	OUT	
21.	**AD04**	OUT	
22.	**V_{DD}**	–	+5V power supply
23.	**AD05**	OUT	Address and pointer
24.	**AD06**	OUT	Pointer and data selection
25.	**AD07**	OUT	Selection of C1/C2
26.	**AD08**	OUT	Selection of read / write
27.	**DB08**	IN/OUT	Data bus of eight bits
28.	**DB07**	IN/OUT	

OUT : OUTPUT, IN : INPUT

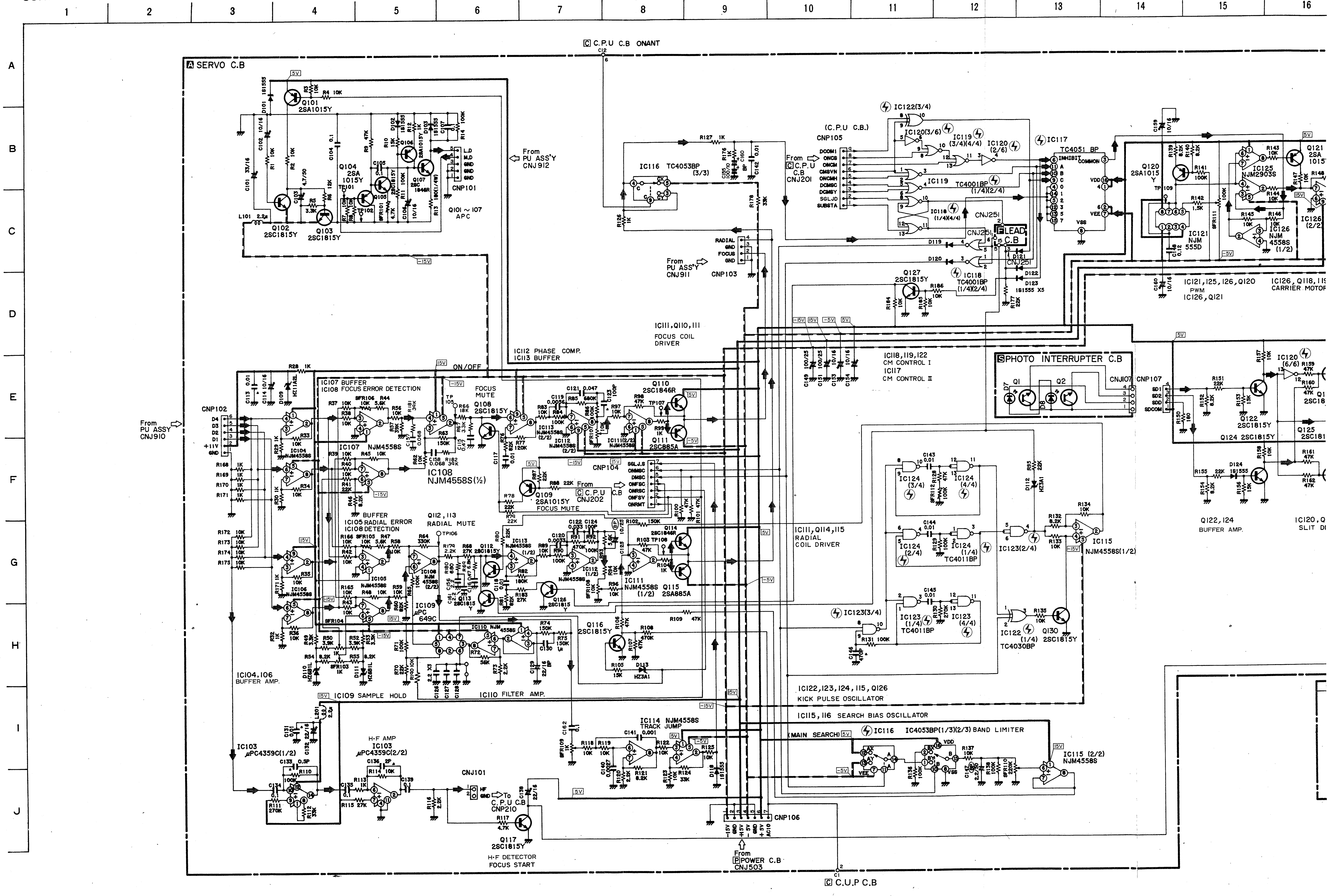
Function : CIRC (Cross Interleave Reed-Solomon Code) modulation – Error detection and correction.

■ACCESSORIES/PACKAGE LIST

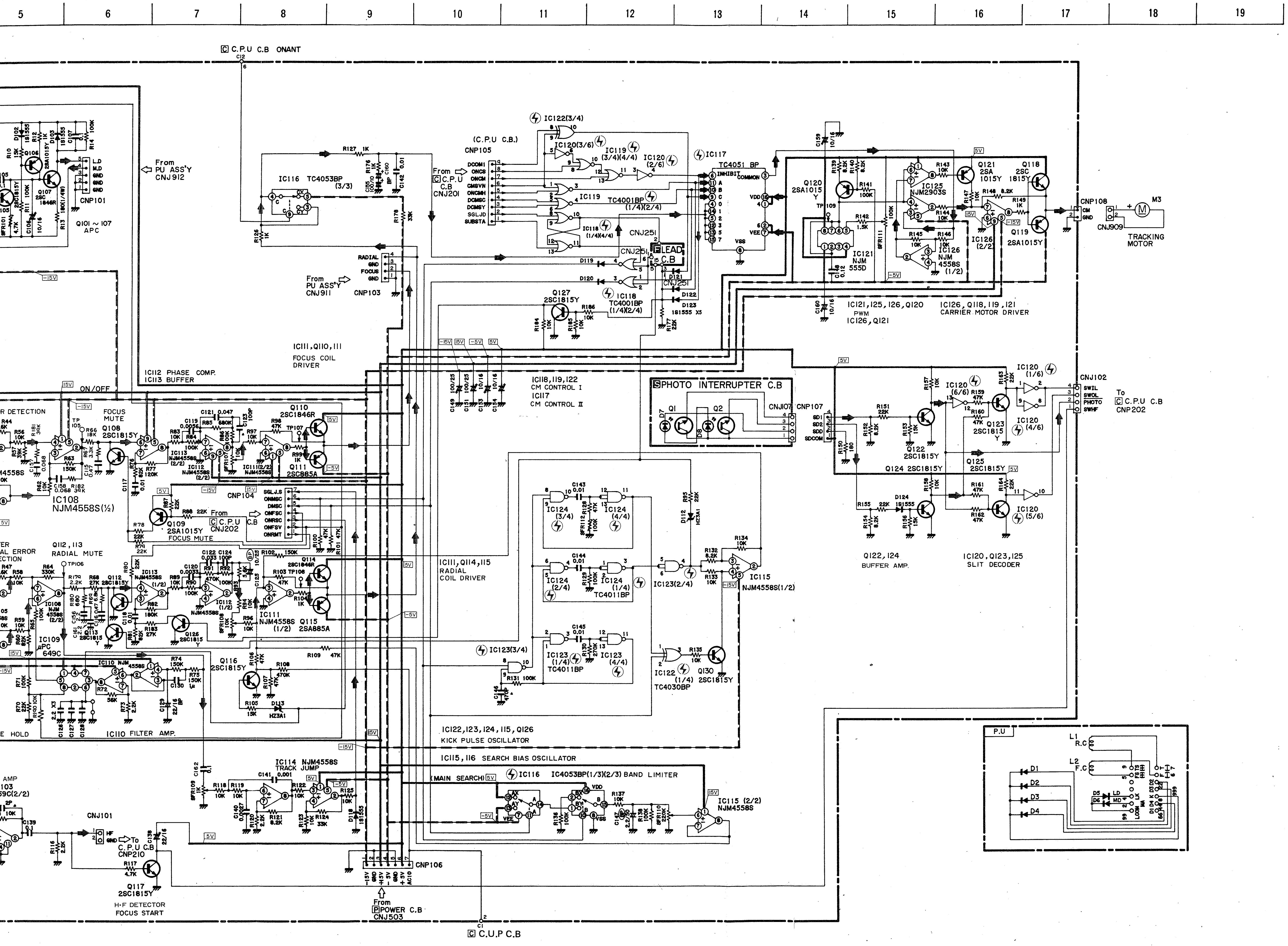
Ref. No.	Part No.	Part No. Changed to	Description	Q'ty
1	84-700-858-01		Printed indiv., Packing	1
2	84-700-852-01		Cushion L, Printed indiv.	1
3	84-700-853-11		Cushion R, Printed indiv.	1
4	87-056-610-01		Poly-vinyl sack	1
5	84-700-905-01		Label E, Screw	1
6	84-700-906-01		Instruction booklet	1
7	87-051-135-11		Poly-vinyl sack	1
8	87-051-171-11		Poly-vinyl sack	1
9	87-056-008-01		Label, AC power cord (K model only)	1
10	87-056-009-51		Distributors list	1
11	84-700-378-01		Adapter (Leg)	4
12	87-032-845-01		Siemens plug (H model only)	1
13	87-034-980-01		Connection cord CW-230BSK	1
14	87-096-089-01		Cloth, Cleaning	1

SCHEMATIC DIAGRAM-5

The ICs on the electrical parts which are indicated by an CMOS IC symbol mark (⚡).


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
C C.P.U C.B ONANT
A SERVO C.B
Q101 2SA1015Y
Q104 2SA 1015Y
Q106 2SA1015Y
Q107 2SC 1846R
Q102 2SC1815Y
Q103 2SC1815Y
Q105 2SC1815Y
CNP101
Q101 ~ 107 APC
From PU ASS'Y CNJ912
IC116 TC4053BP (3/3)
From PU ASS'Y CNJ911
CNP103
RADIAL
GND
FOCUS
GND
(C.P.U C.B.)
CNP105
From C C.P.U C.B CNJ201
DCOMI
ONCS
ONCM
CMSVN
ONCMH
DCMSC
DCMSY
SGLJD
SUBSTA
IC122(3/4)
IC120(3/6)
IC119 (3/4)(4/4)
IC120 (2/6)
IC119 TC4001BP (1/4)(2/4)
IC118 (1/4)(4/4)
IC117
TC4051 BP
INHIBIT
COMMON
VDD
VEE
VSS
CNJ251
F LEAD C.B
D119
D120
D121
D122
D123 1S1555 X5
Q127 2SC1815Y
IC118 TC4001BP (1/4)(2/4)
Q120 2SA1015Y
IC121 NJM 555D
IC125 NJM2903S
IC126 NJM 4558S (1/2)
Q121 2SA 1015
IC121,125,126,Q120 PWM
IC126,Q121
IC126,Q118,119 CARRIER MOTOR
IC111,Q110,111 FOCUS COIL DRIVER
IC112 PHASE COMP.
IC113 BUFFER
ON/OFF
IC107 BUFFER
IC108 FOCUS ERROR DETECTION
FOCUS MUTE
Q108 2SC1815Y
Q110 2SC1846R
Q111 2SC885A
IC112 NJM4558S (2/2)
IC111(2/2) NJM4558S
From PU ASSY CNJ910
CNP102
D4
D3
D2
D1
+11V
GND
IC104 NJM4558S
IC107 NJM4558S
IC108 NJM4558S(½)
Q109 2SA1015Y FOCUS MUTE
CNP104
From C C.P.U C.B CNJ202
SGL.J.S
ONMSC
DMSC
ONFSC
ONRSC
ONFSV
ONRMT
BUFFER
IC105 RADIAL ERROR
IC108 DETECTION
Q112,113 RADIAL MUTE
TP106
IC105 NJM4558S
IC106 NJM4558S
IC108 NJM 4558S (2/2)
IC109 μPC 649C
IC113 NJM4558S (1/2)
IC112 (1/2) NJM4558S
IC111 NJM4558S (1/2)
Q114 2SC1846R
Q115 2SA885A
Q126 2SC1815 Y
Q116 2SC1815Y
IC110 NJM 4558S
IC111,Q114,115 RADIAL COIL DRIVER
IC118,119,122 CM CONTROL I
IC117 CM CONTROL II
S PHOTO INTERRUPTER C.B
Q1
Q2
CNJ107
CNP107
SD1
SD2
SDD
SDCOM
IC124 (3/4)
IC124 (4/4)
IC124 (2/4)
IC124 (1/4) TC4011BP
IC123(2/4)
IC115 NJM4558S(1/2)
IC123(3/4)
IC123 (1/4) TC4011BP
IC123 (4/4)
IC122 (1/4) TC4030BP
Q130 2SC1815Y
IC120 (6/6)
Q122 2SC1815Y
Q124 2SC1815Y
Q122,124 BUFFER AMP.
IC120,Q SLIT D
IC104,106 BUFFER AMP.
IC109 SAMPLE HOLD
IC110 FILTER AMP.
IC122,123,124,115,Q126 KICK PULSE OSCILLATOR
IC115,116 SEARCH BIAS OSCILLATOR
IC114 NJM4558S TRACK JUMP
(MAIN SEARCH)
IC116 IC4053BP(1/3)(2/3) BAND LIMITER
IC115 (2/2) NJM4558S
IC103 μPC4359C(1/2)
H-F AMP
IC103 μPC4359C(2/2)
CNJ101
HF
GND
To C.P.U C.B CNP210
Q117 2SC1815Y
H-F DETECTOR FOCUS START
CNP106
-15V
GND
+15V
-5V
GND
+5V
AC10
From P POWER C.B CNJ503
C C.U.P C.B

Cs on the electrical parts which are indicated by an CMOS IC symbol mark (⚡).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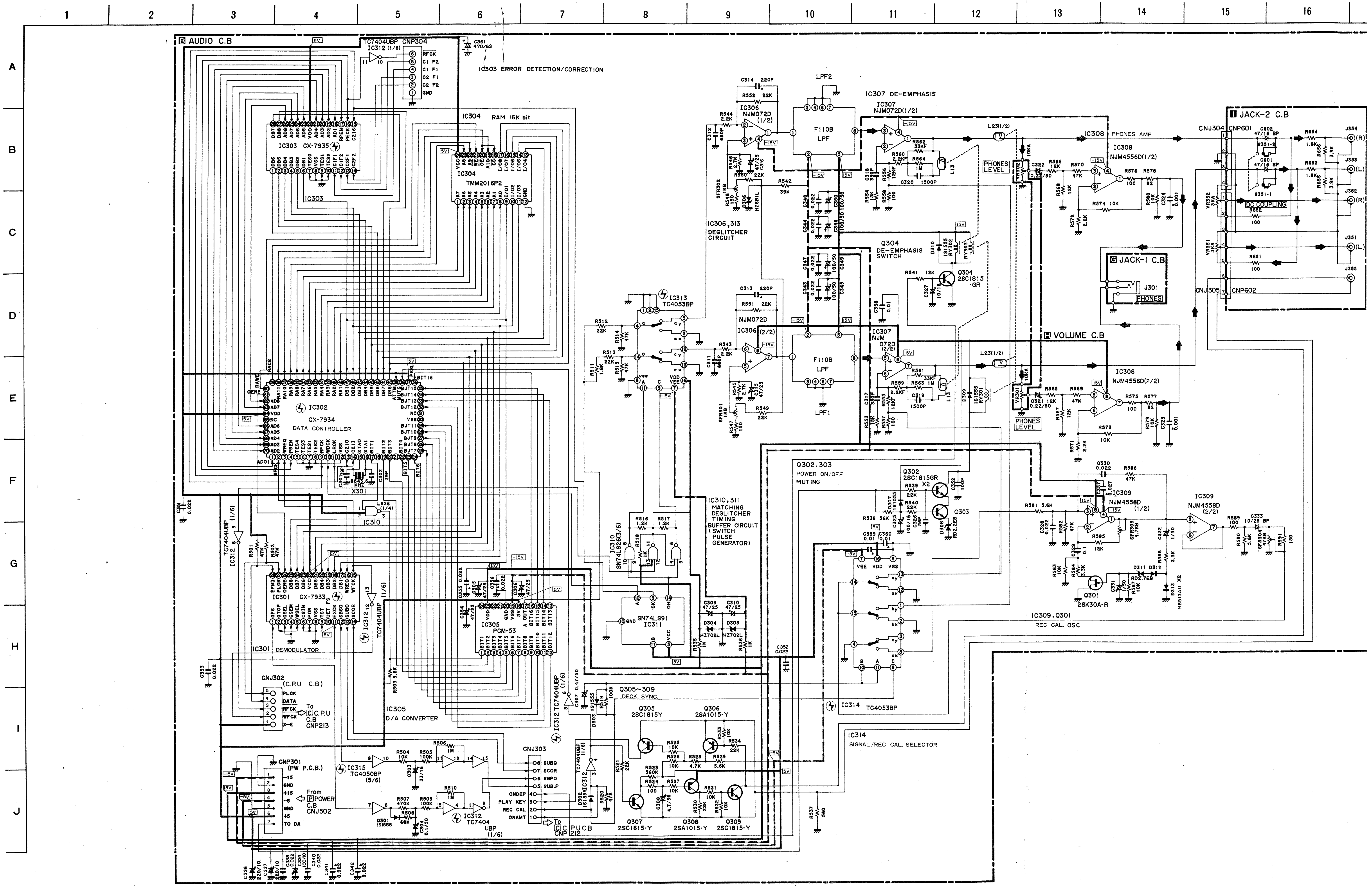
C C.P.U C.B ONANT
From PU ASS'Y CNJ912
Q101 ~ 107 APC
CNP101
From PU ASS'Y CNJ911
CNP103
RADIAL
FOCUS
From C.P.U C.B CNJ201
CNP105
IC116 TC4053BP (3/3)
IC122(3/4)
IC120(3/6)
IC119 (3/4)(4/4)
IC120 (2/6)
IC119 TC4001BP (1/4)(2/4)
IC118 (1/4)(4/4)
IC117 TC4051 BP
CNJ251
F LEAD C.B
IC118 TC4001BP (1/4)(2/4)
Q127 2SC1815Y
IC121, 125, 126, Q120 PWM
IC126, Q121
IC126, Q118, 119, 121 CARRIER MOTOR DRIVER
Q120 2SA1015 Y
IC121 NJM 555D
IC125 NJM2903S
IC126 NJM 4558S (1/2)
IC126 (2/2)
Q121 2SA 1015Y
Q118 2SC 1815Y
Q119 2SA1015Y
CNP108
CNJ909
M3 TRACKING MOTOR
IC111, Q110, 111 FOCUS COIL DRIVER
IC112 PHASE COMP.
IC113 BUFFER
ON/OFF
R DETECTION
FOCUS MUTE
Q108 2SC1815Y
IC113 NJM4558S (2/2)
IC112 NJM4558S (2/2)
IC111(2/2) NJM4558S
Q110 2SC1846R
Q111 2SC885A
IC108 NJM4558S(½)
IC118, 119, 122 CM CONTROL I
IC117 CM CONTROL II
S PHOTO INTERRUPTER C.B
CNJ107
CNP107
CNJ102
SWIL
SWOL
PHOTO
SWHF
To C C.P.U C.B CNP202
IC120 (1/6)
IC120 (6/6)
IC120 (4/6)
IC120 (5/6)
Q122 2SC1815Y
Q123 2SC1815 Y
Q124 2SC1815Y
Q125 2SC1815Y
Q122, 124 BUFFER AMP.
IC120, Q123, 125 SLIT DECODER
CNP104
Q109 2SA1015Y FOCUS MUTE
From C C.P.U C.B CNJ202
Q112, 113 RADIAL MUTE
IC108 NJM 4558S (2/2)
IC109 μPC 649C
IC113 NJM4558S (1/2)
IC112 (1/2) NJM4558S
IC111 NJM4558S (1/2)
Q114 2SC1846R
Q115 2SA885A
Q126 2SC1815
IC111, Q114, 115 RADIAL COIL DRIVER
IC124 (3/4)
IC124 (4/4)
IC124 (2/4)
IC124 (1/4) TC4011BP
IC123(2/4)
IC115 NJM4558S(1/2)
IC123(3/4)
IC123 (1/4) TC4011BP
IC123 (4/4)
IC122 (1/4) TC4030BP
Q130 2SC1815Y
Q116 2SC1815Y
IC110 NJM 4558S
IC110 FILTER AMP.
E HOLD
IC122, 123, 124, 115, Q126 KICK PULSE OSCILLATOR
IC115, 116 SEARCH BIAS OSCILLATOR
IC114 NJM4558S TRACK JUMP
(MAIN SEARCH)
IC116 IC4053BP(1/3)(2/3) BAND LIMITER
IC115 (2/2) NJM4558S
P.U
L1 R.C
L2 F.C
D1
D2
D3
D4
LD
MD
AMP
CNJ101
To C.P.U C.B CNP210
Q117 2SC1815Y
H·F DETECTOR FOCUS START
CNP106
From P POWER C.B CNJ503
C C.U.P C.B

SCHEMATIC DIAGRAM—6

The ICs on the electrical parts which are indicated by an CMOS IC symbol mark (④).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A
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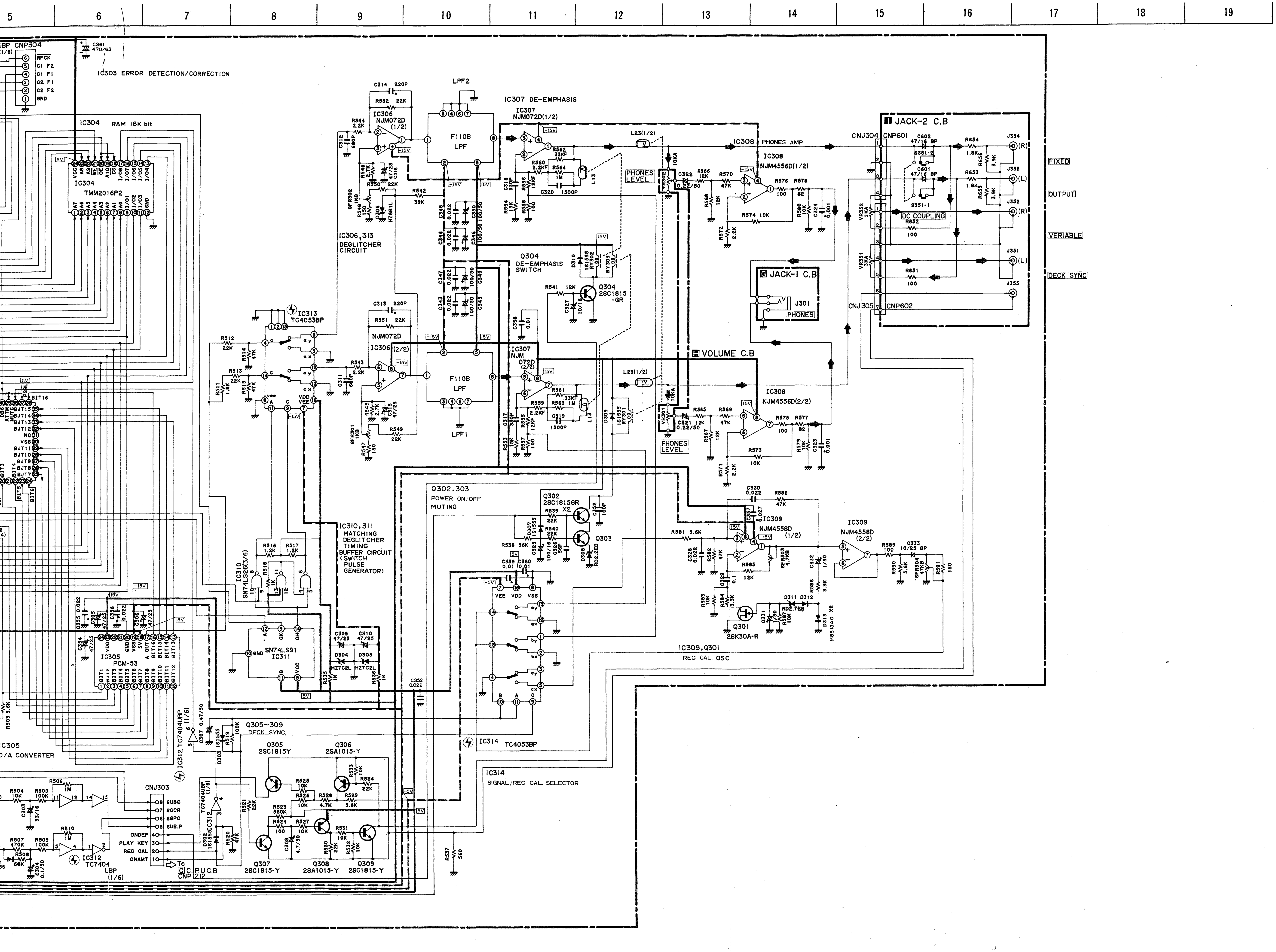
C
D
E
F
G
H
I
J
B AUDIO C.B
TC7404UBP CNP304
IC312 (1/6)
RFCK
C1 F2
C1 F1
C2 F1
C2 F2
GND
C361 470/63
IC303 ERROR DETECTION/CORRECTION
IC303 CX-7935
IC304 RAM 16K bit
IC304 TMM2016P2
IC302 CX-7934 DATA CONTROLLER
X301
IC310
LS26 (1/4)
IC301 CX-7933
IC301 DEMODULATOR
IC305 PCM-53
IC305 D/A CONVERTER
CNJ302 (C.P.U C.B)
PLCK
DATA
RFCK
WFCK
X-E
To C C.P.U C.B CNP213
CNP301 (PW P.C.B.)
From P POWER C.B CNJ502
TO DA
IC315 TC4050BP (5/6)
IC312 TC7404 UBP (1/6)
CNJ303
SUBQ
SCOR
SGPO
SUB.P
ONDEP
PLAY KEY
REC CAL
ONAMT
To C C.P.U C.B CNP212
Q305~309 DECK SYNC.
Q305 2SC1815Y
Q306 2SA1015-Y
Q307 2SC1815-Y
Q308 2SA1015-Y
Q309 2SC1815-Y
IC313 TC4053BP
IC306,313 DEGLITCHER CIRCUIT
IC306 NJM072D (1/2)
IC306 (2/2)
LPF2
LPF1
F110B LPF
IC307 DE-EMPHASIS
IC307 NJM072D(1/2)
Q304 DE-EMPHASIS SWITCH
Q304 2SC1815-GR
IC310,311 MATCHING DEGLITCHER TIMING BUFFER CIRCUIT (SWITCH PULSE GENERATOR)
IC310 SN74LS26(3/6)
SN74LS91 IC311
Q302.303 POWER ON/OFF MUTING
Q302 2SC1815GR X2
Q303
IC308 PHONES AMP
IC308 NJM4556D(1/2)
IC308 NJM4556D(2/2)
PHONES LEVEL
L23(1/2)
L13
H VOLUME C.B
G JACK-1 C.B
J301 PHONES
I JACK-2 C.B
CNJ304 CNP601
CNJ305 CNP602
DC COUPLING
J354 (R)
J353 (L)
J352 (R)
J351 (L)
J355
IC309 NJM4558D (1/2)
IC309 NJM4558D (2/2)
Q301 2SK30A-R
IC309,Q301 REC CAL. OSC
IC314 TC4053BP
IC314 SIGNAL/REC CAL. SELECTOR
15V
-15V
5V
-5V

on the electrical parts which are indicated by an CMOS IC symbol mark (⚡).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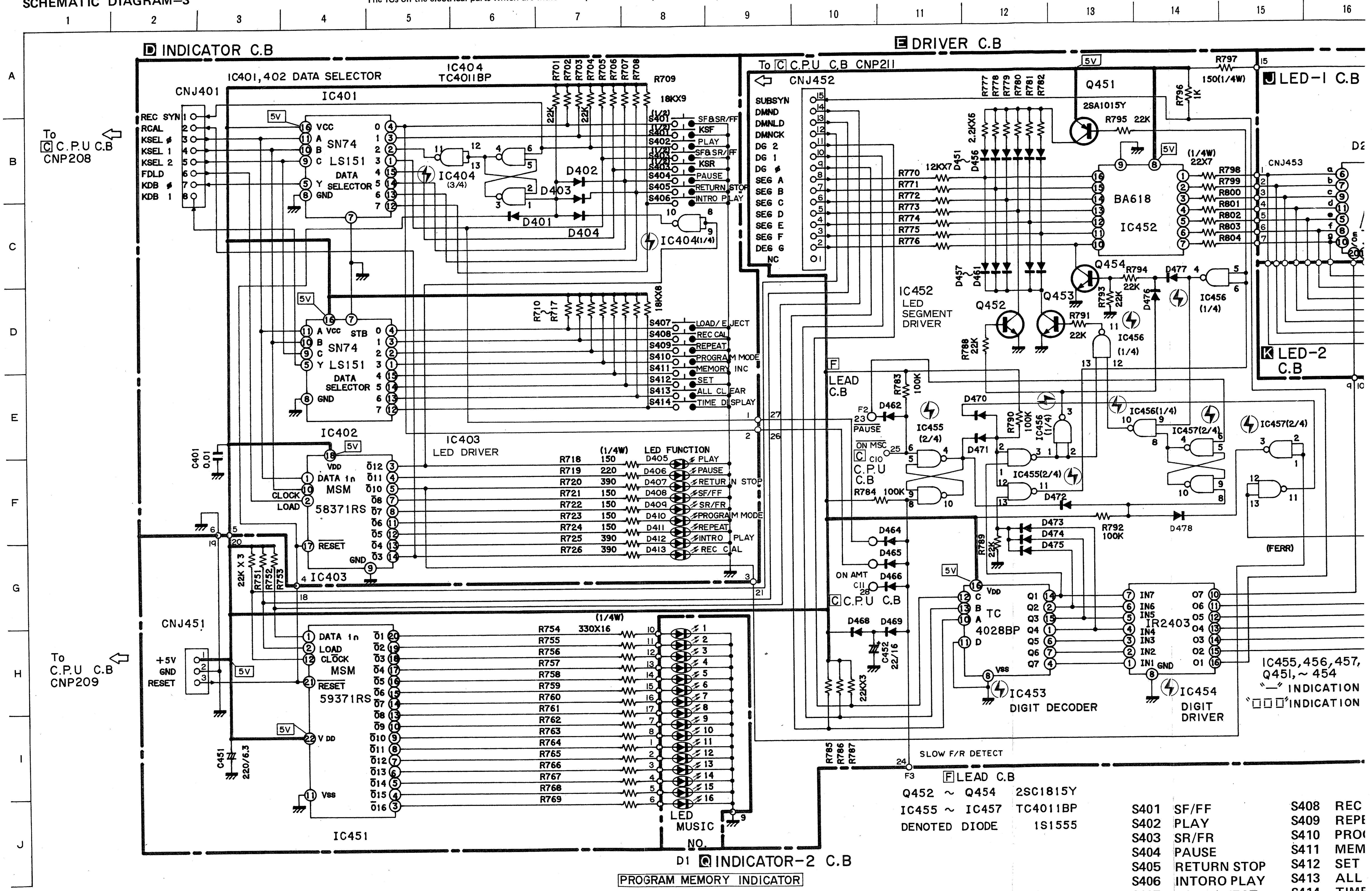
CNP304
IC303 ERROR DETECTION/CORRECTION
IC304 RAM 16K bit
IC304 TMM2016P2
IC306 NJM072D (1/2)
IC306 NJM072D (2/2)
LPF2
LPF1
F110B LPF
IC307 DE-EMPHASIS
IC307 NJM072D(1/2)
IC307 NJM 072D (2/2)
IC306,313 DEGLITCHER CIRCUIT
IC313 TC4053BP
Q304 DE-EMPHASIS SWITCH
Q304 2SC1815-GR
IC308 PHONES AMP
IC308 NJM4556D(1/2)
IC308 NJM4556D(2/2)
PHONES LEVEL
VR302
VR301
H VOLUME C.B
G JACK-1 C.B
J301
PHONES
I JACK-2 C.B
CNJ304
CNP601
CNJ305
CNP602
DC COUPLING
S351-1
S351-2
VR351
VR352
J354 (R)
J353 (L)
J352 (R)
J351 (L)
J355
FIXED
OUTPUT
VERIABLE
DECK SYNC
Q302,303 POWER ON/OFF MUTING
Q302 2SC1815GR X2
Q303
IC310,311 MATCHING DEGLITCHER TIMING BUFFER CIRCUIT (SWITCH PULSE GENERATOR)
IC310 SN74LS26(3/6)
SN74LS91 IC311
IC309 NJM4558D (1/2)
IC309 NJM4558D (2/2)
Q301 2SK30A-R
IC309,Q301 REC CAL. OSC
IC305 PCM-53
IC305 D/A CONVERTER
IC312 TC7404UBP (1/6)
IC312 TC7404 UBP (1/6)
Q305~309 DECK SYNC
Q305 2SC1815Y
Q306 2SA1015-Y
Q307 2SC1815-Y
Q308 2SA1015-Y
Q309 2SC1815-Y
CNJ303
SUBQ
SCOR
SBPO
SUB.P
ONDEP
PLAY KEY
REC CAL
ONAMT
To C/C PU C.B CNP212
IC314 TC4053BP
IC314 SIGNAL/REC CAL. SELECTOR
+5V
-5V
+15V
-15V

SCHEMATIC DIAGRAM-3

The ICs on the electrical parts which are indicated by an CMOS IC symbol mark (⚡).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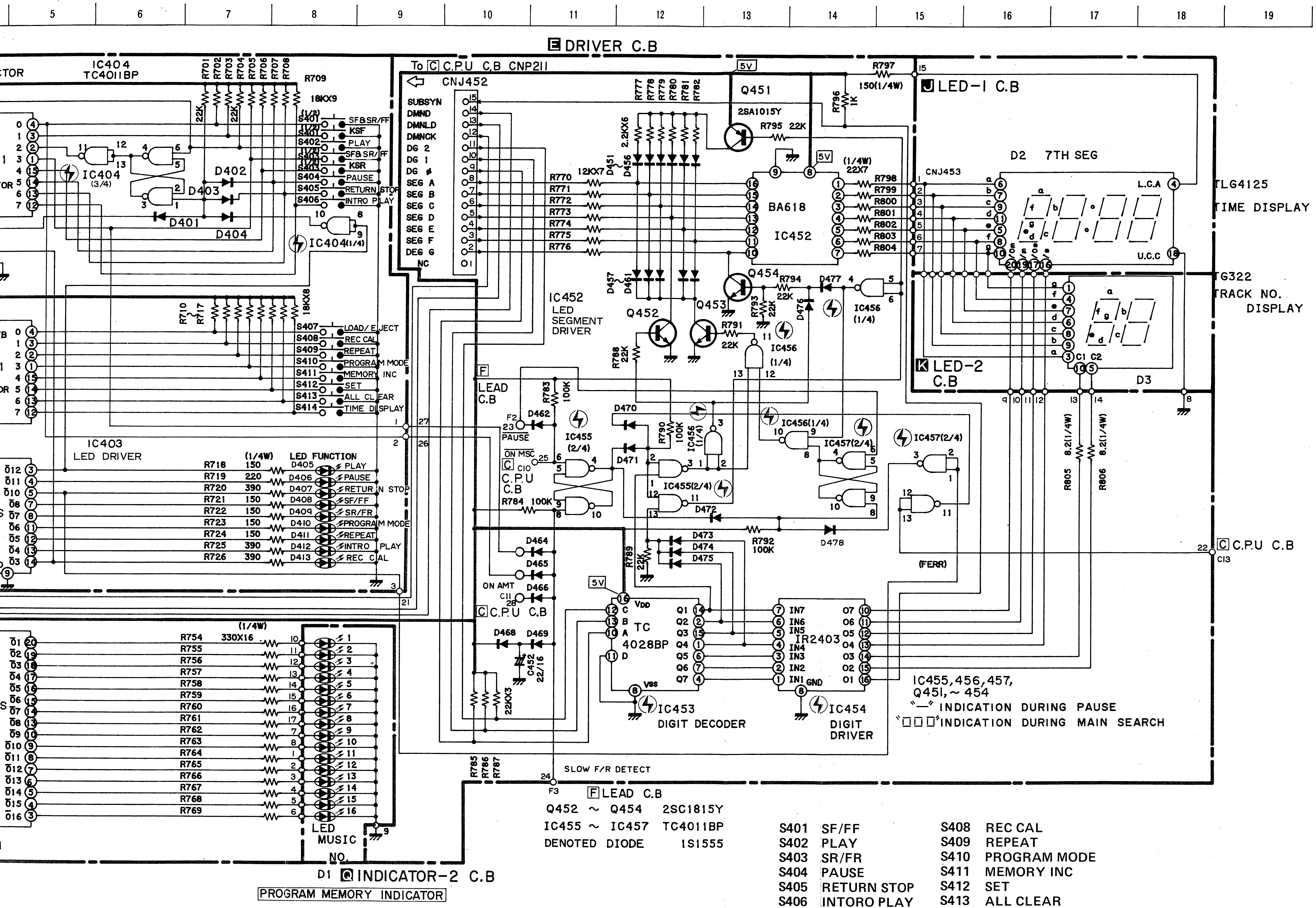
A
B
C
D
E
F
G
H
I
J
D INDICATOR C.B
E DRIVER C.B
J LED-1 C.B
K LED-2 C.B
F LEAD C.B
C C.P.U C.B
Q INDICATOR-2 C.B
PROGRAM MEMORY INDICATOR
To C C.P.U C.B CNP208
To C.P.U C.B CNP209
To C C.P.U C,B CNP211
CNJ401
CNJ451
CNJ452
CNJ453
IC401,402 DATA SELECTOR
IC404 TC4011BP
IC401 SN74 LS151 DATA SELECTOR
IC402 SN74 LS151 DATA SELECTOR
IC403 LED DRIVER
MSM 58371RS
IC451 MSM 59371RS
IC452 BA618
IC452 LED SEGMENT DRIVER
IC453 DIGIT DECODER
TC 4028BP
IC454 DIGIT DRIVER
IR2403
IC455 (2/4)
IC456 (1/4)
IC457(2/4)
Q451 2SA1015Y
Q452
Q453
Q454
REC SYN
RCAL
KSEL ø
KSEL 1
KSEL 2
FDLD
KDB ø
KDB 1
SUBSYN
DMND
DMNLD
DMNCK
DG 2
DG 1
DG ø
SEG A
SEG B
SEG C
SEG D
SEG E
SEG F
DEG G
NC
S401 SF&SR/FF
S402 KSF
PLAY
SF&SR/FF
KSR
S404 PAUSE
S405 RETURN STOP
S406 INTRO PLAY
S407 LOAD/EJECT
S408 REC CAL
S409 REPEAT
S410 PROGRAM MODE
S411 MEMORY INC
S412 SET
S413 ALL CLEAR
S414 TIME DISPLAY
R701–R708 22K
R709 18KX9
R710 ~ R717 18KX8
LED FUNCTION
R718 150 D405 PLAY
R719 220 D406 PAUSE
R720 390 D407 RETURN STOP
R721 150 D408 SF/FF
R722 150 D409 SR/FR
R723 150 D410 PROGRAM MODE
R724 150 D411 REPEAT
R725 390 D412 INTRO PLAY
R726 390 D413 REC CAL
R754 330X16 (1/4W)
LED MUSIC NO.
R770 12KX7
R777–R782 2.2KX6
R797 150(1/4W)
R796 1K
R795 22K
R798–R804 22X7 (1/4W)
R783 100K
R784 100K
R788 22K
R789 22K
R790 100K
R791 22K
R792 100K
R793 22K
R794 22K
R785 R786 R787 22KX3
C401 0.01
C451 220/6.3
C452 22/16
R751 R752 R753 22K X 3
PAUSE
ON MSC
ON AMT
SLOW F/R DETECT
(FERR)
5V
+5V
GND
RESET
CLOCK
LOAD
D401 D402 D403 D404
D456 ~ D461
D462 D464 D465 D466 D468 D469 D470 D471 D472 D473 D474 D475 D476 D477 D478
IC455,456,457, Q451,~ 454
"—" INDICATION
"□□□" INDICATION

Q452 ~ Q454 2SC1815Y
IC455 ~ IC457 TC4011BP
DENOTED DIODE 1S1555

S401 SF/FF
S402 PLAY
S403 SR/FR
S404 PAUSE
S405 RETURN STOP
S406 INTORO PLAY
S407 LOAD/EJECT

S408 REC
S409 REPE
S410 PRO
S411 MEM
S412 SET
S413 ALL
S414 TIME

The ICs on the electrical parts which are indicated by an CMOS IC symbol mark (⚡).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E DRIVER C.B
To C C.P.U C.B CNP211
CNJ452
SUBSYN
DMND
DMNLD
DMNCK
DG 2
DG 1
DG ϕ
SEG A
SEG B
SEG C
SEG D
SEG E
SEG F
SEG G
NC
IC404
TC4011BP
IC404 (3/4)
IC404(1/4)
R701
R702
R703
R704
R705
R706
R707
R708
R709
18KX9
22K
D401
D402
D403
D404
S401 SF&SR/FF
S401 KSF
S402 PLAY
S403 SF&SR/FF
S403 KSR
S404 PAUSE
S405 RETURN STOP
S406 INTRO PLAY
S407 LOAD/EJECT
S408 REC CAL
S409 REPEAT
S410 PROGRAM MODE
S411 MEMORY INC
S412 SET
S413 ALL CLEAR
S414 TIME DISPLAY
R710
R717
18KX8
IC403
LED DRIVER
(1/4W)
LED FUNCTION
R718 150 D405 PLAY
R719 220 D406 PAUSE
R720 390 D407 RETURN STOP
R721 150 D408 SF/FF
R722 150 D409 SR/FR
R723 150 D410 PROGRAM MODE
R724 150 D411 REPEAT
R725 390 D412 INTRO PLAY
R726 390 D413 REC CAL
R754 330X16
R755
R756
R757
R758
R759
R760
R761
R762
R763
R764
R765
R766
R767
R768
R769
LED MUSIC NO.
D1 Q INDICATOR-2 C.B
PROGRAM MEMORY INDICATOR
5V
R797
150(1/4W)
Q451
2SA1015Y
R795 22K
R796 1K
R777
R778
R779
R780
R781
R782
2.2KX6
D451
D456
D457
D461
R770
R771
R772
R773
R774
R775
R776
12KX7
(1/4W) 22X7
R798
R799
R800
R801
R802
R803
R804
BA618
IC452
IC452 LED SEGMENT DRIVER
Q452
Q453
Q454
R794 22K
R793 22K
R791 22K
R788 22K
D477
D476
IC456 (1/4)
J LED-1 C.B
CNJ453
D2 7TH SEG
L.C.A
U.C.C
TLG4125
TIME DISPLAY
TG322
TRACK NO. DISPLAY
K LED-2 C.B
D3
C1 C2
R805 8.2(1/4W)
R806 8.2(1/4W)
F LEAD C.B
F2 23 PAUSE
D462
R783 100K
IC455 (2/4)
ON MSC C C10 25
C C.P.U C.B
R784 100K
D470
D471
R790 100K
IC456 (1/4)
IC455(2/4)
D472
IC456(1/4)
IC457(2/4)
IC457(2/4)
R792 100K
D478
(FERR)
D473
D474
D475
R789 22K
D464
D465
ON AMT C11 28
D466
C C.P.U C.B
D468
D469
C452 22/16
22KX3
5V
VDD
TC 4028BP
VSS
IC453 DIGIT DECODER
IN7
IN6
IN5
IN4
IN3
IN2
IN1
GND
IR2403
IC454 DIGIT DRIVER
C C.P.U C.B
22 C13
SLOW F/R DETECT
24 F3
R785
R786
R787
F LEAD C.B

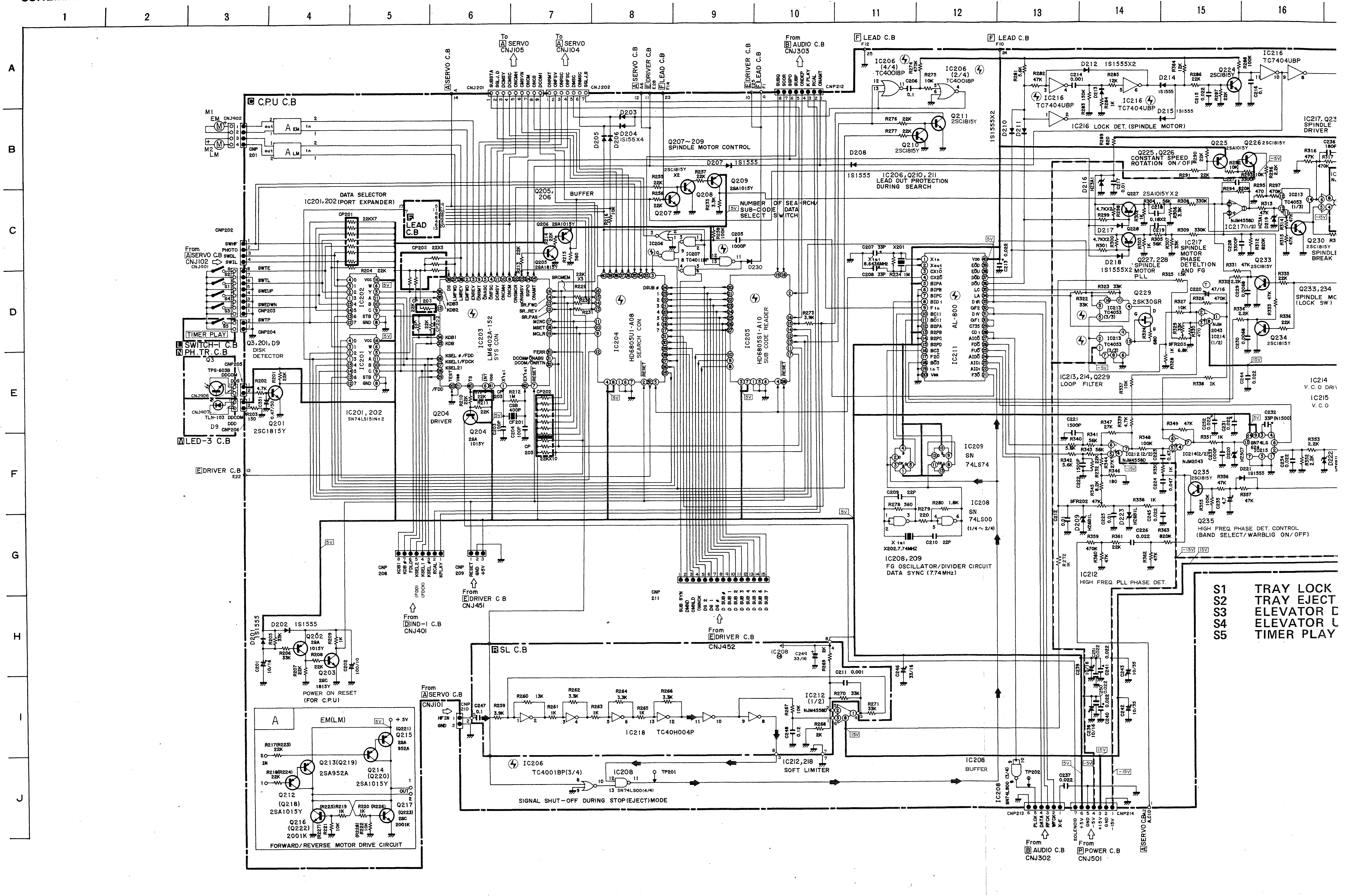
IC455, 456, 457,
Q451, ~ 454
"—" INDICATION DURING PAUSE
"□□□" INDICATION DURING MAIN SEARCH

Q452 ~ Q454 2SC1815Y
IC455 ~ IC457 TC4011BP
DENOTED DIODE 1S1555

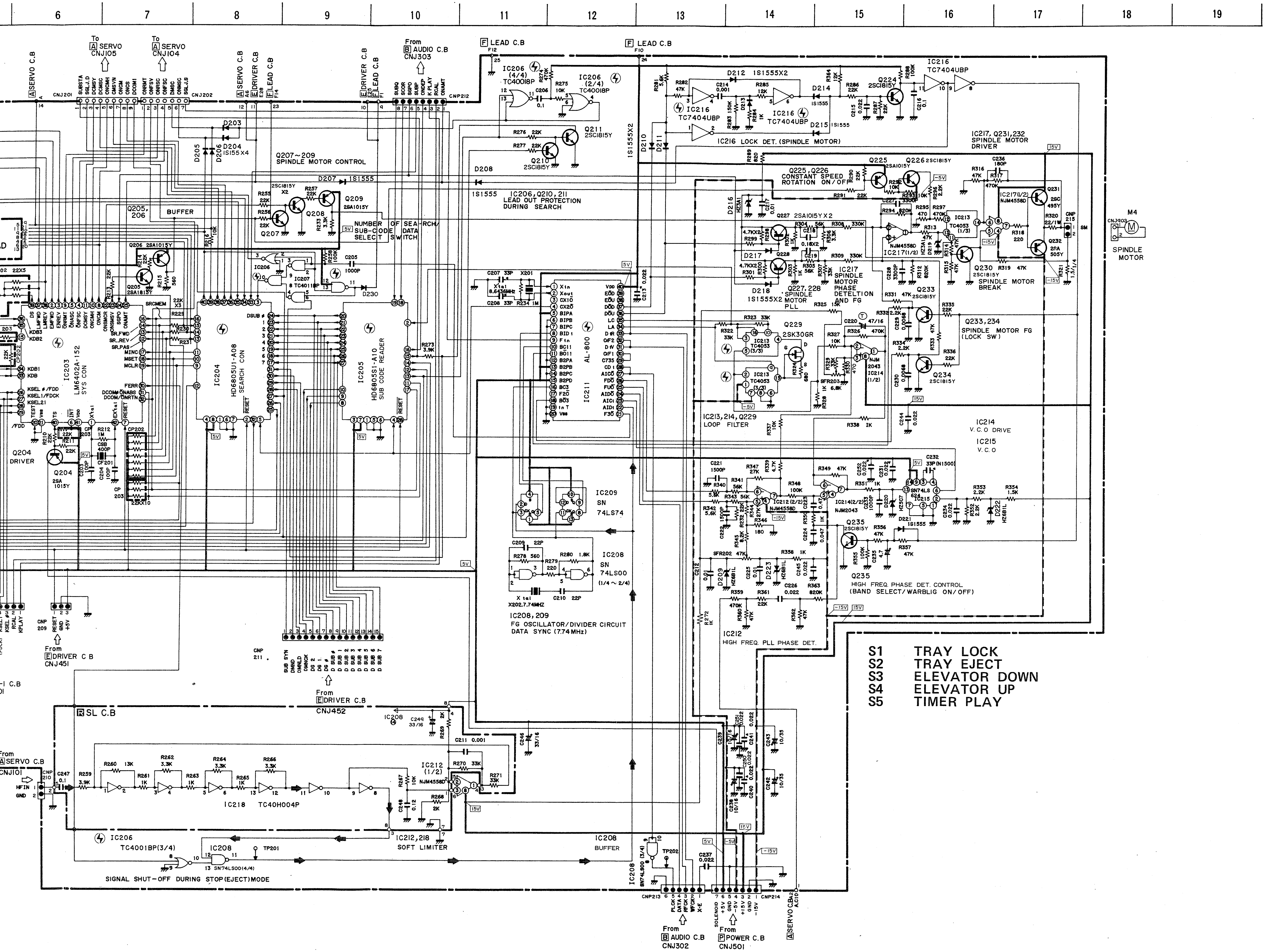
S401	SF/FF	S408	REC CAL
S402	PLAY	S409	REPEAT
S403	SR/FR	S410	PROGRAM MODE
S404	PAUSE	S411	MEMORY INC
S405	RETURN STOP	S412	SET
S406	INTORO PLAY	S413	ALL CLEAR
S407	LOAD/EJECT	S414	TIME DISPLAY

SCHEMATIC DIAGRAM–4

The ICs on the electrical parts which are indicated by an CMOS IC symbol mark (⚡).


C C.P.U C.B
To A SERVO CNJ105
To A SERVO CNJ104
From B AUDIO C.B CNJ303
F LEAD C.B
A SERVO C.B
E DRIVER C.B
F LEAD C.B
M1 EM
M2 LM
DATA SELECTOR IC201, 202 (PORT EXPANDER)
F LEAD C.B
BUFFER
Q205, 206
Q207~209 SPINDLE MOTOR CONTROL
NUMBER OF SEARCH/ SUB-CODE DATA SELECT SWITCH
IC206 (4/4) TC4001BP
IC206 (2/4) TC4001BP
IC216 TC7404UBP
IC216 LOCK DET. (SPINDLE MOTOR)
IC206, Q210, 211 LEAD OUT PROTECTION DURING SEARCH
Q225, Q226 CONSTANT SPEED ROTATION ON/OFF
IC217, Q230 SPINDLE DRIVER
IC217 SPINDLE MOTOR PHASE DETELTION AND FG
Q227, 228 SPINDLE MOTOR PLL
Q230 SPINDLE BREAK
Q233, 234 SPINDLE MOTOR (LOCK SW)
IC213, 214, Q229 LOOP FILTER
IC214 V.C.O DRIVER
IC215 V.C.O
IC202 IC201
IC201, 202 SN74LS151N×2
IC203 LM6402A-152 SYS CON
IC204 HD6805U1-A08 SEARCH CON
IC205 HD6805S1-A10 SUB CODE READER
IC211 AL-800
IC209 SN 74LS74
IC208 SN 74LS00 (1/4~2/4)
IC208, 209 FG OSCILLATOR/DIVIDER CIRCUIT DATA SYNC (7.74MHz)
Q235 HIGH FREQ. PHASE DET. CONTROL (BAND SELECT/WARBLIG ON/OFF)
IC212 HIGH FREQ. PLL PHASE DET.
From A SERVO C.B CNJ102
TIMER PLAY
L SWITCH-I C.B
N PH.TR.C.B
Q3, 201, D9 DISK DETECTOR
M LED-3 C.B
Q201 2SC1815Y
Q204 DRIVER
E DRIVER C.B
CNP 208
CNP 209
From E DRIVER C.B CNJ451
From D IND-I C.B CNJ401
CNP 211
From E DRIVER C.B CNJ452
POWER ON RESET (FOR C.P.U)
R SL C.B
From A SERVO C.B CNJ101
IC218 TC40H004P
IC212 (1/2) NJM4558D
IC206 TC4001BP (3/4)
IC208 13 SN74LS00 (4/4)
SIGNAL SHUT-OFF DURING STOP (EJECT) MODE
IC212, 218 SOFT LIMITER
IC208 BUFFER
A EM(LM)
FORWARD/REVERSE MOTOR DRIVE CIRCUIT
From B AUDIO C.B CNJ302
From P POWER C.B CNJ501
A SERVO C.B
S1 TRAY LOCK
S2 TRAY EJECT
S3 ELEVATOR D
S4 ELEVATOR U
S5 TIMER PLAY

ectrical parts which are indicated by an CMOS IC symbol mark (⚡).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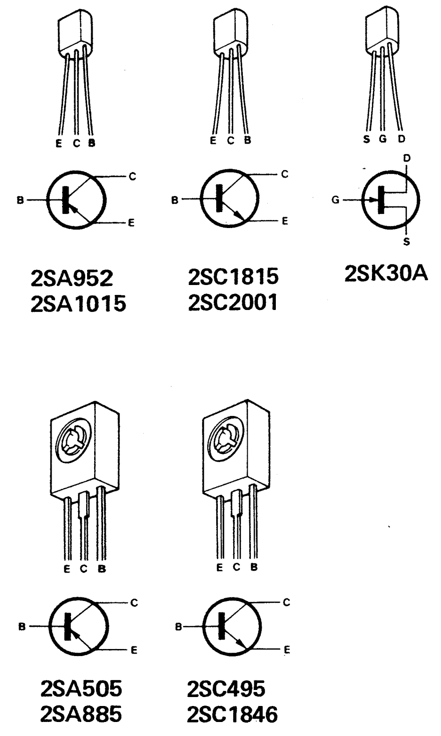
18
19
To A SERVO CNJ105
To A SERVO CNJ104
From B AUDIO C.B CNJ303
F LEAD C.B
F LEAD C.B
CNJ201
CNJ202
CNP212
IC206 (4/4) TC4001BP
IC206 (2/4) TC4001BP
Q211 2SC1815Y
Q210 2SC1815Y
D212 1S1555X2
IC216 TC7404UBP
IC216 LOCK DET. (SPINDLE MOTOR)
Q224 2SC1815Y
IC216 TC7404UBP
Q207~209 SPINDLE MOTOR CONTROL
D207 1S1555
D208 1S1555
IC206, Q210, 211 LEAD OUT PROTECTION DURING SEARCH
Q205, 206 BUFFER
Q209 2SA1015Y
Q208
Q207
NUMBER OF SEARCH/ SUB-CODE DATA SELECT SWITCH
Q206 2SA1015Y
Q205 2SA1815Y
IC203 LM6402A-152 SYS CON
IC204 HD6805U1-A08 SEARCH CON
IC205 HD6805S1-A10 SUB CODE READER
IC211 AL-800
X201 8.6436MHz
IC217, Q231, 232 SPINDLE MOTOR DRIVER
Q225, Q226 CONSTANT SPEED ROTATION ON/OFF
Q225 2SA1015Y
Q226 2SC1815Y
Q227 2SA1015Y X2
Q228
IC217 (1/2) NJM4558D
IC213 TC4053 (1/3)
Q231 2SC495Y
Q232 2SA505Y
Q230 2SC1815Y SPINDLE MOTOR BREAK
IC217 SPINDLE MOTOR PHASE DETELTION AND FG
D218 1S1555X2
Q227, 228 SPINDLE MOTOR PLL
Q229 2SK30GR
IC213 TC4053 (3/3)
IC213 TC4053 (3/3)
IC214 NJM2043 (1/2)
Q233 2SC1815Y
Q233, 234 SPINDLE MOTOR FG (LOCK SW)
Q234 2SC1815Y
IC213, 214, Q229 LOOP FILTER
IC214 V.C.O DRIVE
IC215 V.C.O
M4 SPINDLE MOTOR
CNJ403
Q204 DRIVER
Q204 2SA1015Y
IC209 SN 74LS74
IC208 SN 74LS00 (1/4 ~ 2/4)
X tal X202,7.74MHZ
IC208, 209 FG OSCILLATOR/DIVIDER CIRCUIT DATA SYNC (7.74MHz)
IC212 (2/2) NJM4558D
IC214 (2/2) NJM2043
SN74LS IC215
Q235 2SC1815Y
Q235 HIGH FREQ. PHASE DET. CONTROL (BAND SELECT/WARBLIG ON/OFF)
IC212 HIGH FREQ. PLL PHASE DET.
CNP 209
From E DRIVER C B CNJ451
CNP 211
From E DRIVER C.B CNJ452
R SL C.B
From A SERVO C.B CNJ101
CNP 210
HFIN
GND
IC218 TC40H004P
IC212 (1/2) NJM4558D
IC208
IC206 TC4001BP (3/4)
IC208 SN74LS00 (4/4)
TP201
SIGNAL SHUT-OFF DURING STOP (EJECT) MODE
IC212, 218 SOFT LIMITER
IC208 BUFFER
IC208 SN74LS00 (3/4)
TP202
CNP213
CNP214
From B AUDIO C.B CNJ302
From P POWER C.B CNJ501
A SERVO C.B

S1	TRAY LOCK
S2	TRAY EJECT
S3	ELEVATOR DOWN
S4	ELEVATOR UP
S5	TIMER PLAY


E C B
B
C
E
2SA952
2SA1015
2SC1815
2SC2001
S G D
G
D
S
2SK30A
2SA505
2SA885
2SC495
2SC1846

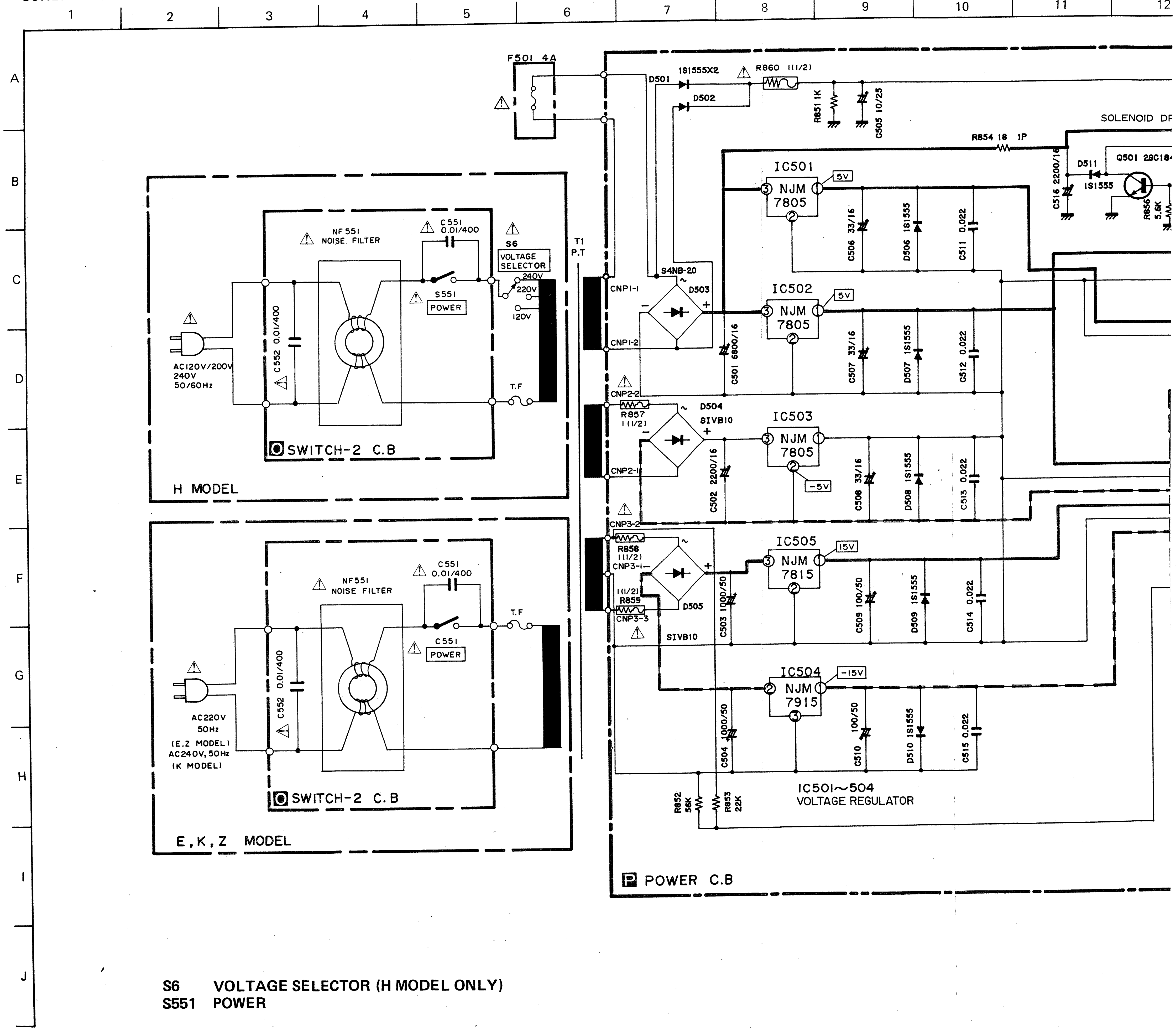
NOTES:

1) ▮▮ B (+) power supply ▮▮▮ B (−) power supply
2) ➡ Signal path
3) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals. But ( ) is with AM reception or recording. An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.
4) Resistors with no designation have a rated power of 1/8W and a tolerance of ±5%.
5) Capacitors with no designation have a dielectric strength of less than 50WV.
6) The only capacitor tolerance indicated are ±5% (J) and ±10% (K)
7) Ceramic capacitor symbols:
   - For temperature compensation (SL)
   - High dielectric constant system (YY)
   - High dielectric constant system (YW, YP, YZ)
   - Semiconductor ceramic
   - For temperature compensation (SH)
8) Explanation of symbols
   - Ⓜ Mylar capacitor
   - Ⓐ Aluminum solid capacitor
   - (PP) Polypropylene film capacitor
   - (BP) Bi-polarized capacitor
   - (LL) Low-leakage capacitor
   - Ⓣ Tantalum capacitor
   - Fuse resistor
   - Nonflammable resistor
   - (LN) Low noise resistor

⚠ Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

- This schematic diagram is subject to change without notice in the interests of improved performance.

SCHEMATIC DIAGRAM–1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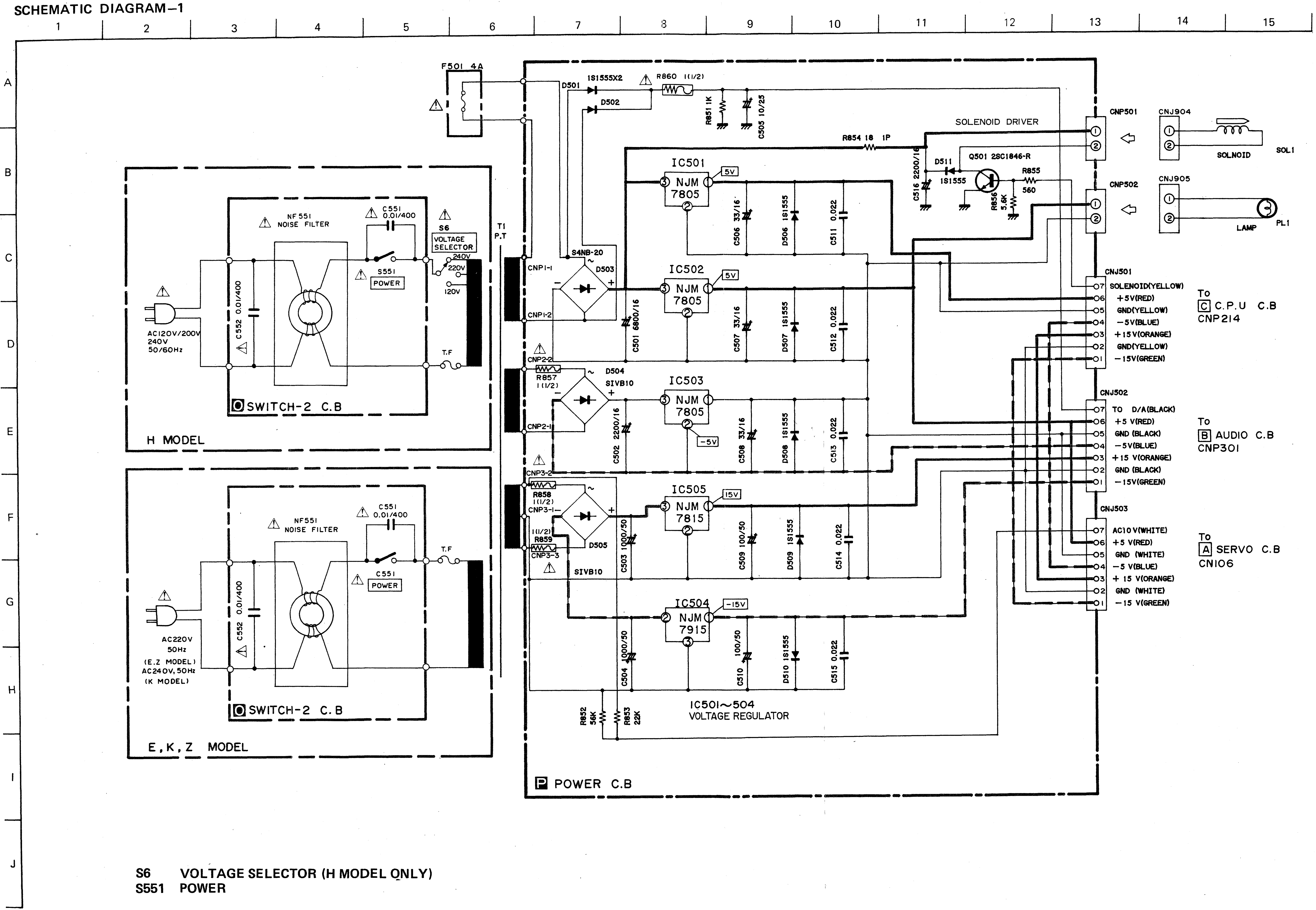
11
12
A
B
C
D
E
F
G
H
I
J
F501 4A
D501
1S1555X2
R860 1(1/2)
D502
R851 1K
C505 10/25
SOLENOID DR
R854 18 1P
C516 2200/16
D511
1S1555
Q501 2SC18
R856 5.6K
NF551 NOISE FILTER
C551 0.01/400
S6 VOLTAGE SELECTOR
240V
220V
120V
S551 POWER
C552 0.01/400
AC120V/200V 240V 50/60Hz
T.F
SWITCH-2 C.B
H MODEL
T1 P.T
CNP1-1
CNP1-2
S4NB-20
D503
C501 6800/16
IC501 NJM 7805
5V
C506 33/16
D506 1S1555
C511 0.022
IC502 NJM 7805
5V
C507 33/16
D507 1S1555
C512 0.022
CNP2-2
R857 1(1/2)
D504 S1VB10
CNP2-1
C502 2200/16
IC503 NJM 7805
-5V
C508 33/16
D508 1S1555
C513 0.022
CNP3-2
R858 1(1/2)
CNP3-1
R859 1(1/2)
CNP3-3
D505
S1VB10
C503 1000/50
IC505 NJM 7815
15V
C509 100/50
D509 1S1555
C514 0.022
NF551 NOISE FILTER
C551 0.01/400
T.F
C551 POWER
C552 0.01/400
AC220V 50Hz (E.Z MODEL) AC240V, 50Hz (K MODEL)
SWITCH-2 C.B
E, K, Z MODEL
IC504 NJM 7915
-15V
C504 1000/50
C510 100/50
D510 1S1555
C515 0.022
R852 56K
R853 22K
IC501~504 VOLTAGE REGULATOR
POWER C.B

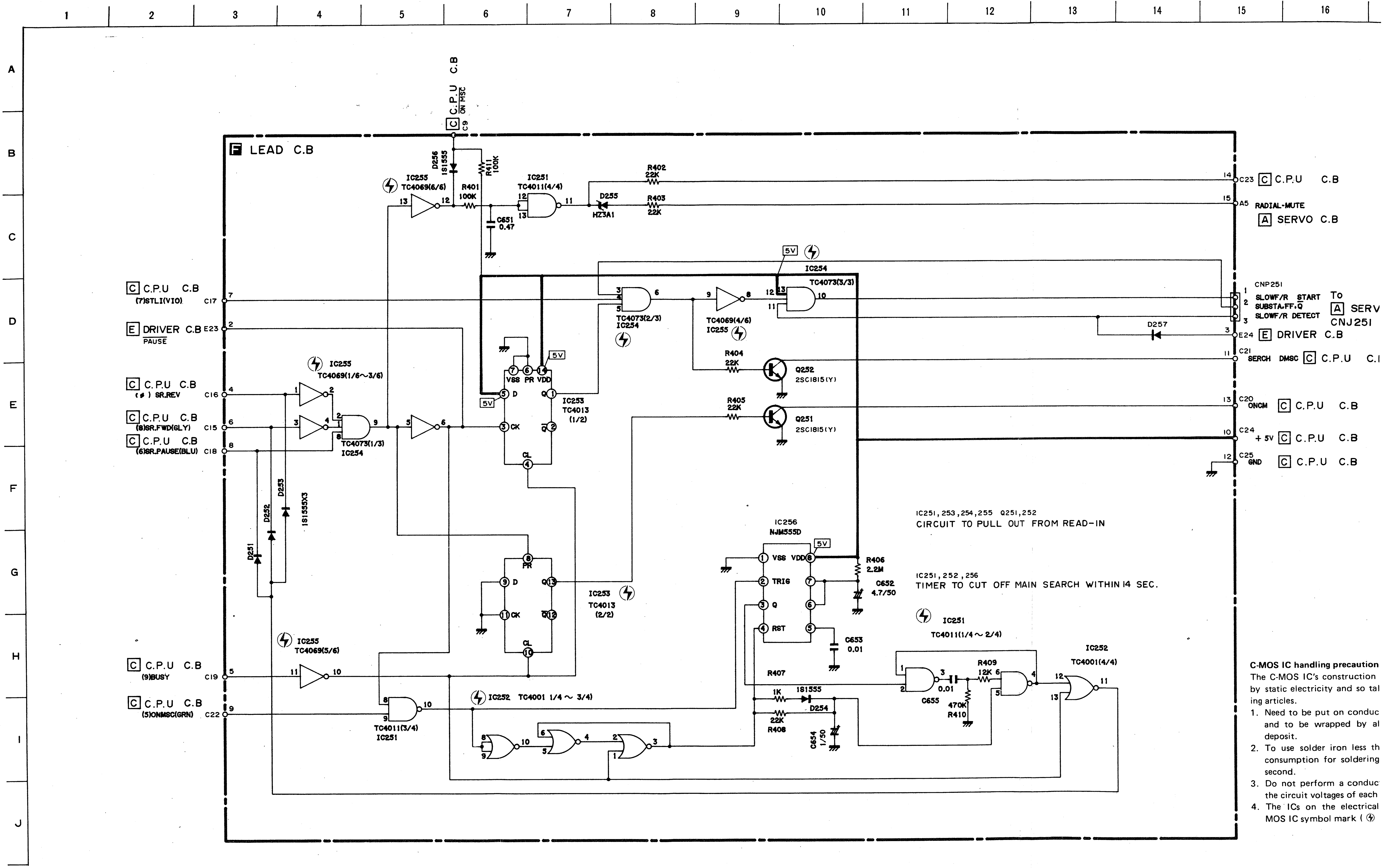
S6 VOLTAGE SELECTOR (H MODEL ONLY)
S551 POWER

SCHEMATIC DIAGRAM–1


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
F501 4A
D501
1S1555X2
R860 1(1/2)
D502
R851 1K
C505 10/25
SOLENOID DRIVER
R854 18 1P
C516 2200/16
D511
1S1555
Q501 2SC1846-R
R855 560
R856 5.6K
CNP501
CNJ904
SOLNOID
SOL1
CNP502
CNJ905
LAMP
PL1
IC501
NJM 7805
5V
C506 33/16
D506 1S1555
C511 0.022
IC502
NJM 7805
5V
C507 33/16
D507 1S1555
C512 0.022
S4NB-20
D503
C501 6800/16
CNP1-1
CNP1-2
T1 P.T
CNP2-2
R857 1(1/2)
D504
SIVB10
CNP2-1
C502 2200/16
IC503
NJM 7805
-5V
C508 33/16
D508 1S1555
C513 0.022
CNP3-2
R858 1(1/2)
CNP3-1
1(1/2) R859
CNP3-3
D505
SIVB10
C503 1000/50
IC505
NJM 7815
15V
C509 100/50
D509 1S1555
C514 0.022
IC504
NJM 7915
-15V
C504 1000/50
C510 100/50
D510 1S1555
C515 0.022
R852 56K
R853 22K
IC501~504
VOLTAGE REGULATOR
P POWER C.B
CNJ501
7 SOLENOID(YELLOW)
6 +5V(RED)
5 GND(YELLOW)
4 -5V(BLUE)
3 +15V(ORANGE)
2 GND(YELLOW)
1 -15V(GREEN)
To
C C.P.U C.B
CNP214
CNJ502
7 TO D/A(BLACK)
6 +5 V(RED)
5 GND (BLACK)
4 -5V(BLUE)
3 +15 V(ORANGE)
2 GND (BLACK)
1 -15V(GREEN)
To
B AUDIO C.B
CNP301
CNJ503
7 AC10 V(WHITE)
6 +5 V(RED)
5 GND (WHITE)
4 -5 V(BLUE)
3 + 15 V(ORANGE)
2 GND (WHITE)
1 -15 V(GREEN)
To
A SERVO C.B
CN106
NF551 NOISE FILTER
C551 0.01/400
S6
VOLTAGE SELECTOR
240V
220V
120V
S551
POWER
AC120V/200V
240V
50/60Hz
C552 0.01/400
T.F
O SWITCH-2 C.B
H MODEL
NF551 NOISE FILTER
C551 0.01/400
C551
POWER
T.F
AC220V
50Hz
(E.Z MODEL)
AC240V, 50Hz
(K MODEL)
C552 0.01/400
O SWITCH-2 C.B
E, K, Z MODEL

S6 VOLTAGE SELECTOR (H MODEL ONLY)
S551 POWER

SCHEMATIC DIAGRAM–2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A
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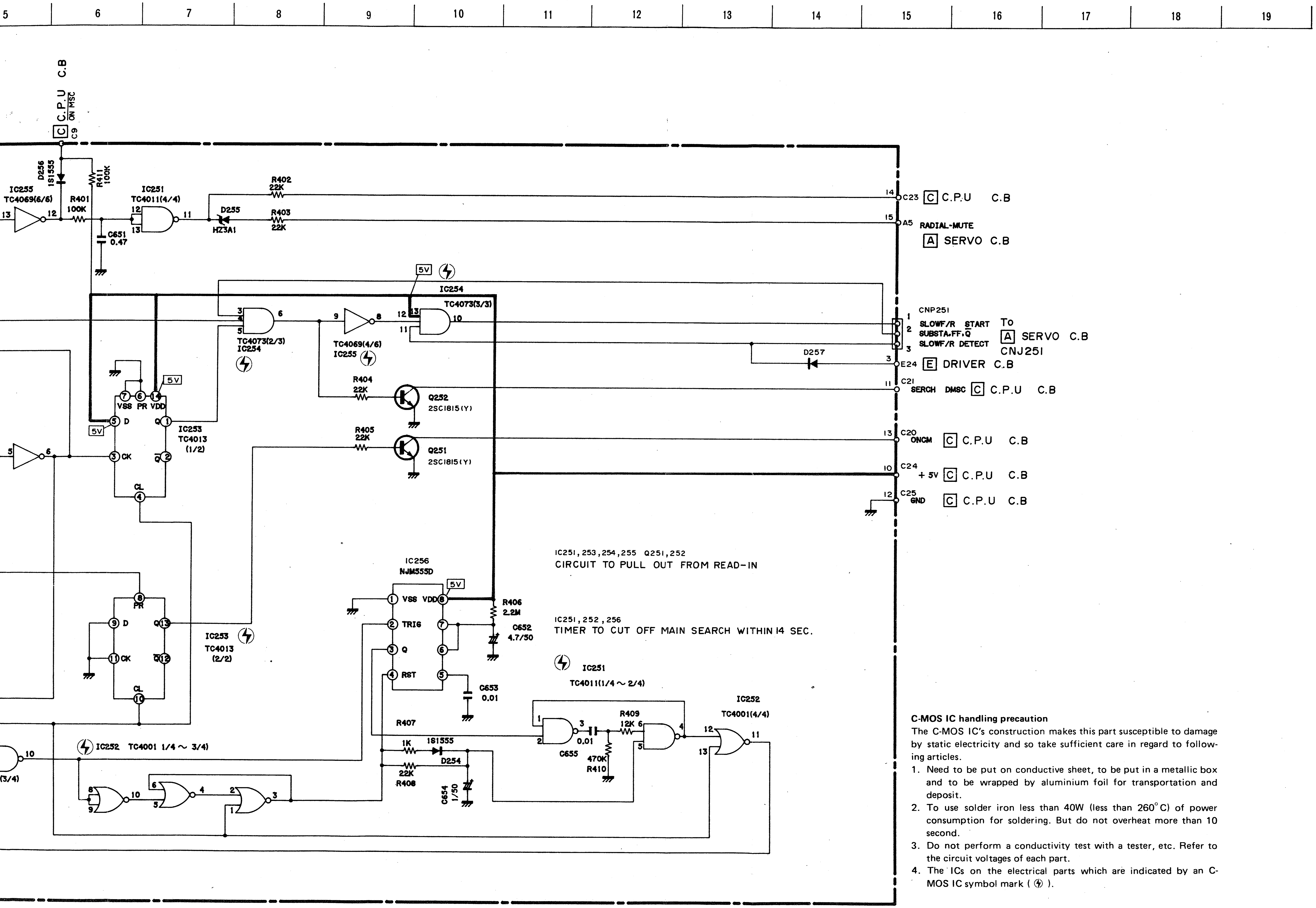
D
E
F
G
H
I
J
F LEAD C.B
C C.P.U C.B
ON MSC
C9
D256 1S1555
R411 100K
IC255 TC4069(6/6)
R401 100K
IC251 TC4011(4/4)
C651 0.47
R402 22K
R403 22K
D255 HZ3A1
C23 C C.P.U C.B
A5 RADIAL-MUTE
A SERVO C.B
5V
IC254 TC4073(3/3)
CNP251
SLOWF/R START
SUBSTA.FF.Q
SLOWF/R DETECT
To
A SERV
CNJ251
D257
E24 E DRIVER C.B
C21 SERCH DMSC C C.P.U C.
C C.P.U C.B
(7)STLI(VIO) C17
E DRIVER C.B E23
PAUSE
TC4073(2/3) IC254
TC4069(4/6) IC255
R404 22K
Q252 2SC1815(Y)
R405 22K
Q251 2SC1815(Y)
C20 ONCM C C.P.U C.B
C24 +5V C C.P.U C.B
C25 GND C C.P.U C.B
IC255 TC4069(1/6~3/6)
C C.P.U C.B
(#) SR.REV C16
C C.P.U C.B
(8)SR.FWD(GLY) C15
C C.P.U C.B
(6)SR.PAUSE(BLU) C18
TC4073(1/3) IC254
VSS PR VDD
D CK CL
IC253 TC4013 (1/2)
D251
D252
D253
1S1555X3
IC253 TC4013 (2/2)
IC256 NJM555D
VSS VDD TRIG Q RST
R406 2.2M
C652 4.7/50
C653 0.01
IC251,253,254,255 Q251,252
CIRCUIT TO PULL OUT FROM READ-IN
IC251,252,256
TIMER TO CUT OFF MAIN SEARCH WITHIN 14 SEC.
IC251 TC4011(1/4~2/4)
IC252 TC4001(4/4)
R409 12K
C655 0.01
470K R410
R407 1K
1S1555 D254
22K R408
C654 1/50
IC255 TC4069(5/6)
C C.P.U C.B
(9)BUSY C19
C C.P.U C.B
(5)ONMSC(GRN) C22
TC4011(3/4) IC251
IC252 TC4001 1/4 ~ 3/4

C-MOS IC handling precaution

The C-MOS IC's construction
by static electricity and so tal
ing articles.

1. Need to be put on conduc
and to be wrapped by al
deposit.
2. To use solder iron less th
consumption for soldering
second.
3. Do not perform a conduc
the circuit voltages of each
4. The ICs on the electrical
MOS IC symbol mark (⚡)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14
15
16
17
18
19
C C.P.U C.B
C9 ON MSC
D256 1S1555
R411 100K
IC255 TC4069(6/6)
R401 100K
IC251 TC4011(4/4)
C651 0.47
R402 22K
D255 HZ3A1
R403 22K
C23 C C.P.U C.B
A5 RADIAL-MUTE
A SERVO C.B
5V
IC254 TC4073(3/3)
TC4073(2/3) IC254
TC4069(4/6) IC255
CNP251
SLOWF/R START
SUBSTA.FF.Q
SLOWF/R DETECT
To A SERVO C.B CNJ251
D257
E24 E DRIVER C.B
R404 22K
Q252 2SC1815(Y)
C21 SERCH DMSC C C.P.U C.B
R405 22K
Q251 2SC1815(Y)
C20 ONCM C C.P.U C.B
C24 +5V C C.P.U C.B
C25 GND C C.P.U C.B
VSS PR VDD
D Q CK Q̄ CL
IC253 TC4013 (1/2)
PR D Q CK Q̄ CL
IC253 TC4013 (2/2)
IC256 NJM555D
VSS VDD TRIG Q RST
R406 2.2M
C652 4.7/50
C653 0.01
R407 1K 1S1555
D254
R408 22K
C654 1/50
IC252 TC4001 1/4 ~ 3/4
IC251, 253, 254, 255 Q251, 252
CIRCUIT TO PULL OUT FROM READ-IN
IC251, 252, 256
TIMER TO CUT OFF MAIN SEARCH WITHIN 14 SEC.
IC251 TC4011(1/4 ~ 2/4)
C655 0.01
R409 12K
R410 470K
IC252 TC4001(4/4)

C-MOS IC handling precaution

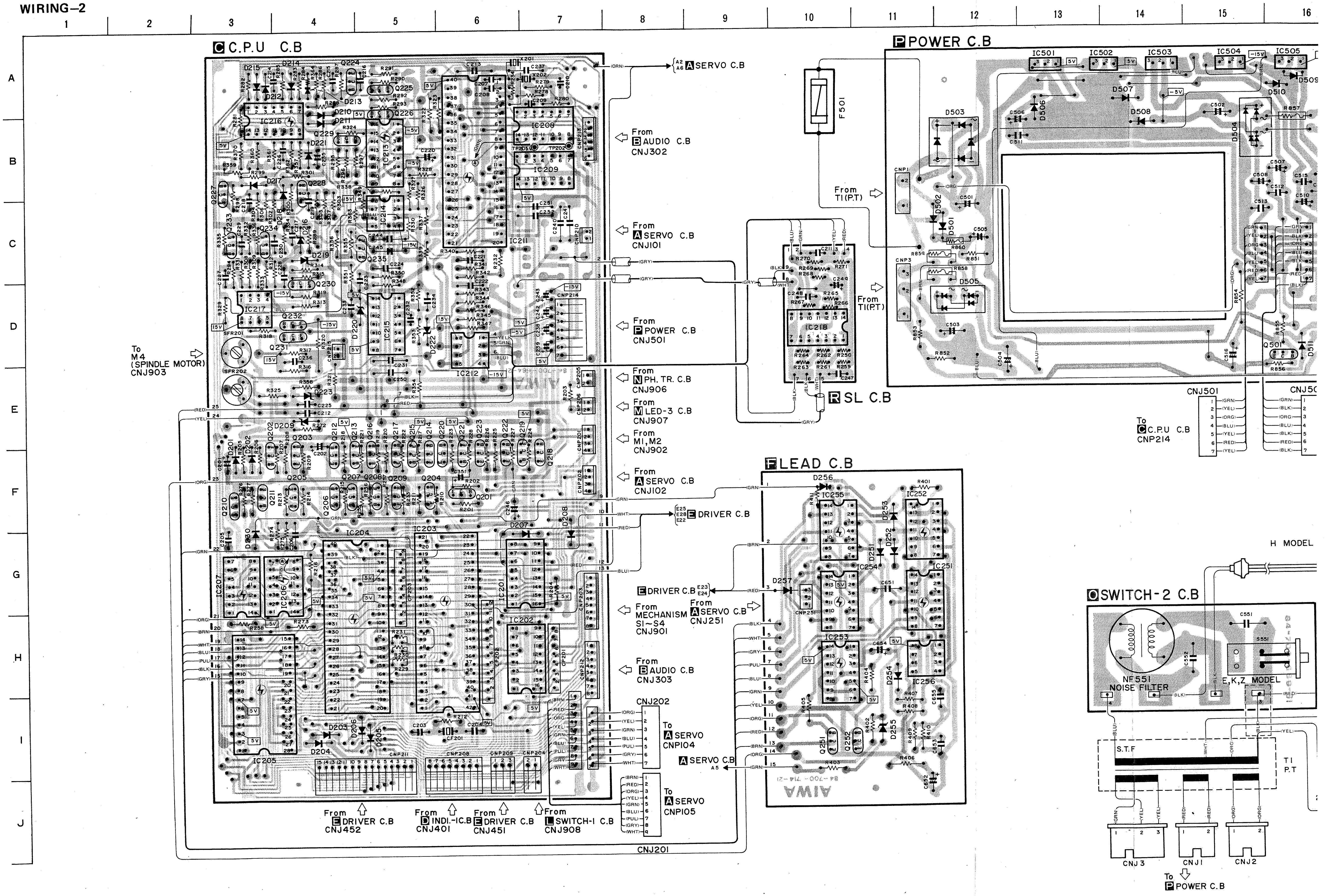
The C-MOS IC's construction makes this part susceptible to damage by static electricity and so take sufficient care in regard to following articles.

1. Need to be put on conductive sheet, to be put in a metallic box and to be wrapped by aluminium foil for transportation and deposit.
2. To use solder iron less than 40W (less than 260°C) of power consumption for soldering. But do not overheat more than 10 second.
3. Do not perform a conductivity test with a tester, etc. Refer to the circuit voltages of each part.
4. The ICs on the electrical parts which are indicated by an C-MOS IC symbol mark (ϟ).

NOTES (1) ▨ Parts side pattern ▨ Others pattern

(2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when th

WIRING–2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A
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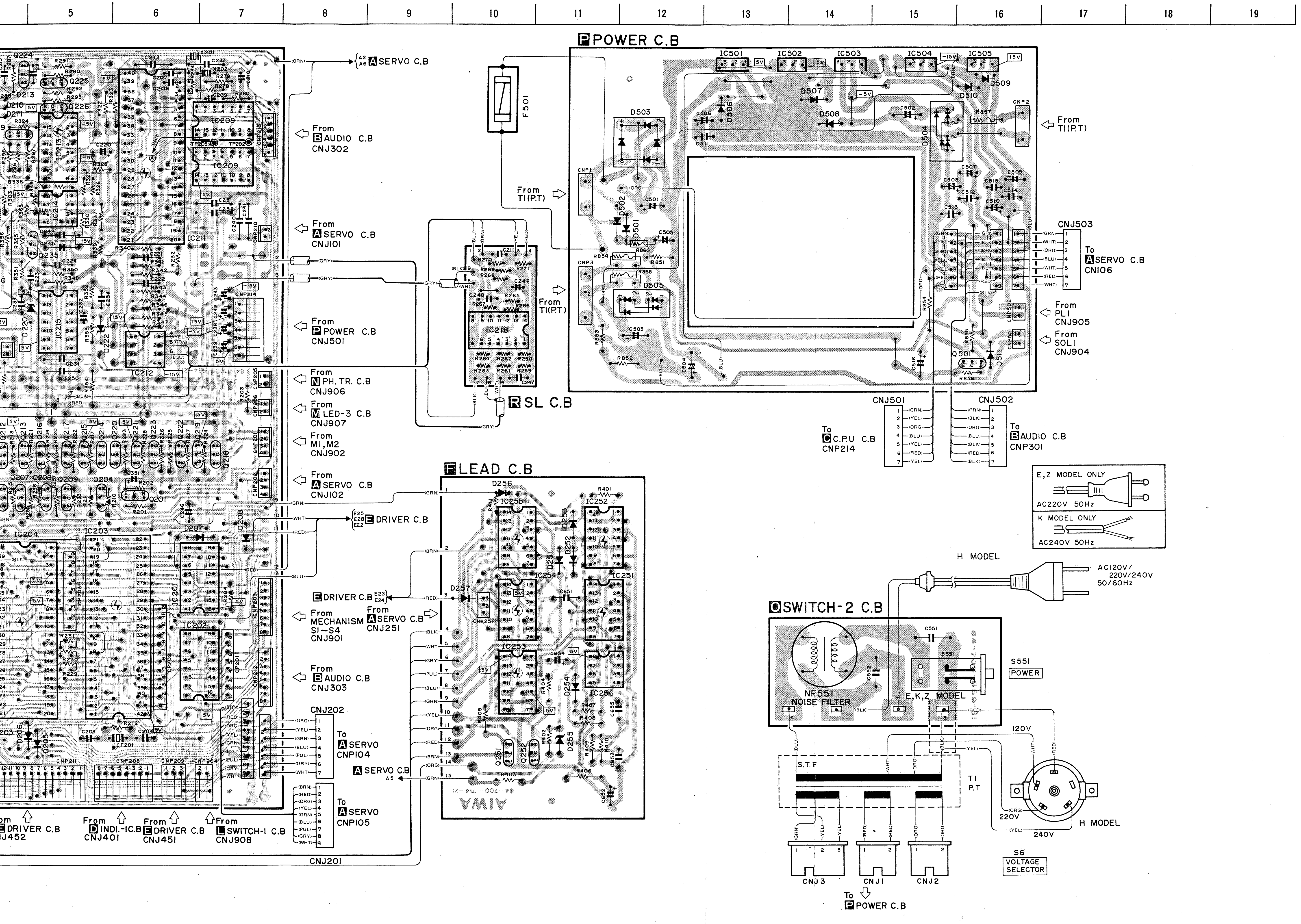
C
D
E
F
G
H
I
J
C C.P.U C.B
A2 A6 A SERVO C.B
From B AUDIO C.B CNJ302
From A SERVO C.B CNJ101
From P POWER C.B CNJ501
To M4 (SPINDLE MOTOR) CNJ903
From N PH. TR. C.B CNJ906
From M LED-3 C.B CNJ907
From M1, M2 CNJ902
From A SERVO C.B CNJ102
E25 E28 E22 E DRIVER C.B
E23 E24 E DRIVER C.B
From MECHANISM S1~S4 CNJ901
From A SERVO C.B CNJ251
From B AUDIO C.B CNJ303
CNJ202
To A SERVO CNP104
A SERVO C.B A5
To A SERVO CNP105
From E DRIVER C.B CNJ452
From D INDI.-IC.B CNJ401
From E DRIVER C.B CNJ451
From L SWITCH-1 C.B CNJ908
CNJ201
P POWER C.B
IC501
IC502
IC503
IC504
IC505
F501
From T1 (P.T)
From T1 (P.T)
R SL C.B
IC218
CNJ501
To C C.P.U C.B CNP214
CNJ50
F LEAD C.B
IC255
IC252
IC254
IC251
IC253
IC256
H MODEL
O SWITCH-2 C.B
NF551 NOISE FILTER
E,K,Z MODEL
S551
S.T.F
T1 P.T
CNJ3
CNJ1
CNJ2
To P POWER C.B
IC216
IC213
IC208
IC209
IC214
IC211
IC217
IC215
IC212
IC204
IC203
IC207
IC206
IC201
IC202
IC205
SFR201
SFR202
CNP214
CNP211
CNP208
CNP209
CNP204
AIWA

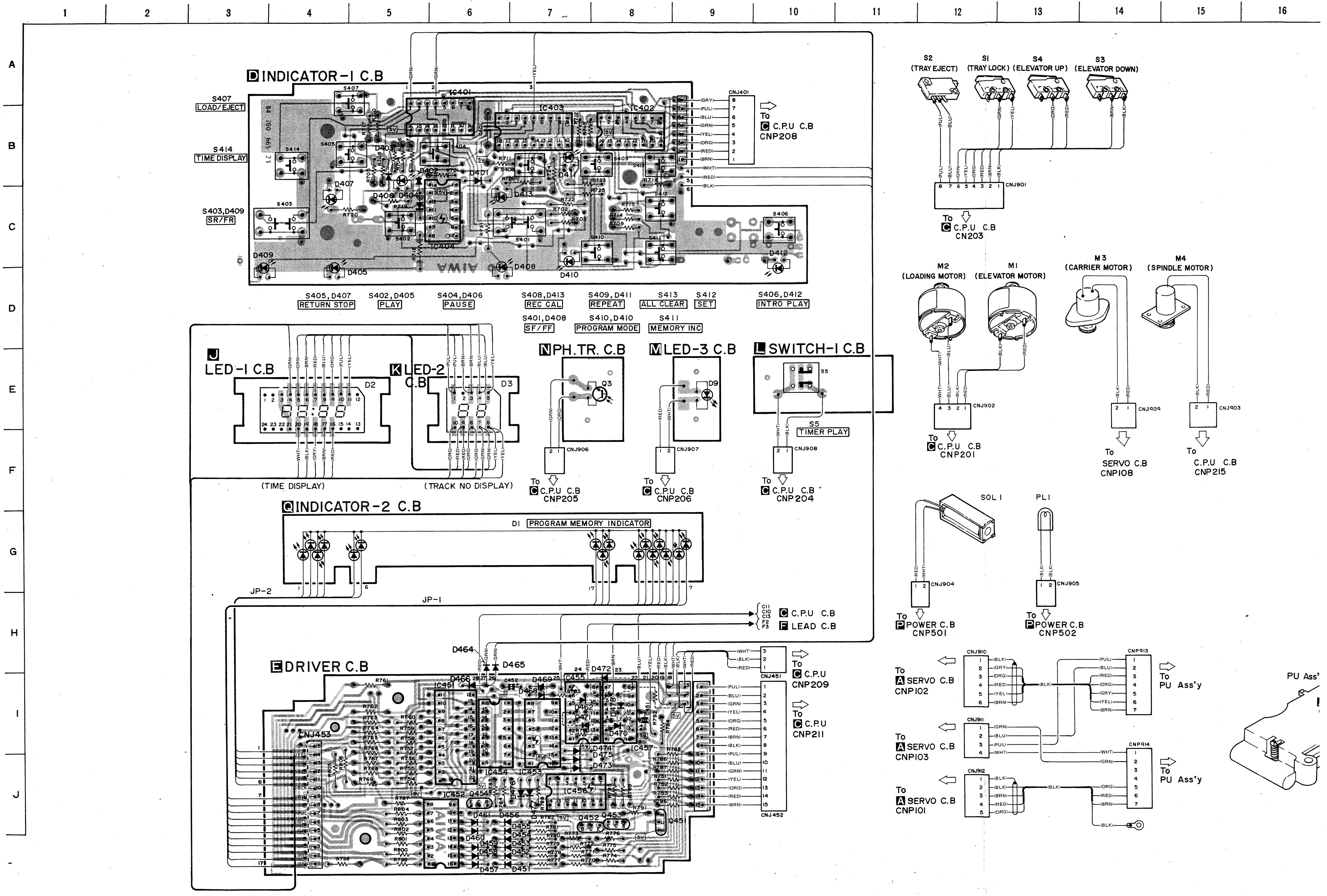
NOTES (1) ▨ Parts side pattern ▨ Others pattern
(2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.


5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
P POWER C.B
R SL C.B
F LEAD C.B
O SWITCH-2 C.B
A2 A6 A SERVO C.B
From B AUDIO C.B CNJ302
From A SERVO C.B CNJ101
From P POWER C.B CNJ501
From N PH. TR. C.B CNJ906
From M LED-3 C.B CNJ907
From M1, M2 CNJ902
From A SERVO C.B CNJ102
E25 E28 E22 E DRIVER C.B
E DRIVER C.B E23 E24
From MECHANISM S1~S4 CNJ901
From A SERVO C.B CNJ251
From B AUDIO C.B CNJ303
CNJ202
To A SERVO CNP104
A SERVO C.B A5
To A SERVO CNP105
From E DRIVER C.B CNJ452
From D INDI.-IC.B CNJ401
From E DRIVER C.B CNJ451
From L SWITCH-1 C.B CNJ908
CNJ201
F501
From T1(P.T)
From T1(P.T)
From T1(P.T)
IC501 IC502 IC503 IC504 IC505
D503 D504 D505 D506 D507 D508 D509 D510 D501 D502 D511
CNP1 CNP2 CNP3
CNJ503
To A SERVO C.B CN106
From PL1 CNJ905
From SOL1 CNJ904
CNJ501
To C C.P.U C.B CNP214
CNJ502
To B AUDIO C.B CNP301
E,Z MODEL ONLY
AC220V 50Hz
K MODEL ONLY
AC240V 50Hz
H MODEL
AC120V/220V/240V 50/60Hz
NF551 NOISE FILTER
S551 POWER
E,K,Z MODEL
120V
220V
240V
H MODEL
S.T.F
T1 P.T
S6 VOLTAGE SELECTOR
CNJ3 CNJ1 CNJ2
To P POWER C.B
IC201 IC202 IC203 IC204 IC208 IC209 IC211 IC212 IC213 IC214 IC215 IC218
IC251 IC252 IC253 IC254 IC255 IC256
AIWA

NOTES (1) ▨ Parts side pattern ▨ Others pattern

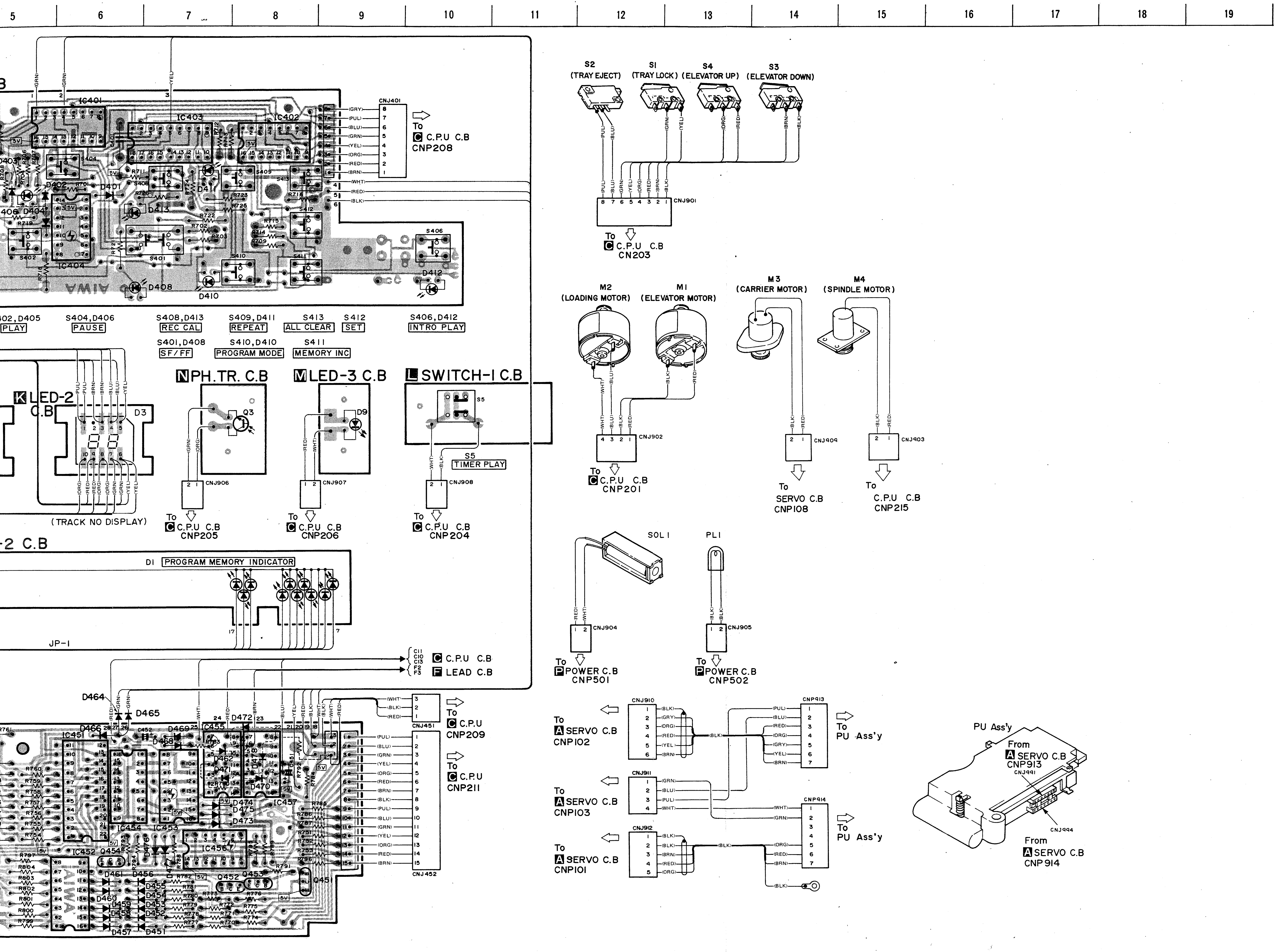
(2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.

WIRING–3


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
D INDICATOR-1 C.B
S407 LOAD/EJECT
S414 TIME DISPLAY
S403,D409 SR/FR
IC401
IC403
IC402
IC404
CNJ401
To C C.P.U C.B CNP208
S405,D407 RETURN STOP
S402,D405 PLAY
S404,D406 PAUSE
S408,D413 REC CAL
S401,D408 SF/FF
S409,D411 REPEAT
S410,D410 PROGRAM MODE
S413 ALL CLEAR
S411 MEMORY INC
S412 SET
S406,D412 INTRO PLAY
J LED-1 C.B
D2
(TIME DISPLAY)
K LED-2 C.B
D3
(TRACK NO DISPLAY)
N PH.TR. C.B
Q3
CNJ906
To C C.P.U C.B CNP205
M LED-3 C.B
D9
CNJ907
To C C.P.U C.B CNP206
L SWITCH-1 C.B
S5
S5 TIMER PLAY
CNJ908
To C C.P.U C.B CNP204
Q INDICATOR-2 C.B
D1 PROGRAM MEMORY INDICATOR
JP-2
JP-1
C11 C10 C13 F2 F3
C C.P.U C.B
F LEAD C.B
E DRIVER C.B
D464
D465
IC451
IC452
IC453
IC454
IC455
IC456
IC457
CNJ453
CNJ451
To C C.P.U CNP209
CNJ452
To C C.P.U CNP211
S2 (TRAY EJECT)
S1 (TRAY LOCK)
S4 (ELEVATOR UP)
S3 (ELEVATOR DOWN)
CNJ901
To C C.P.U C.B CN203
M2 (LOADING MOTOR)
M1 (ELEVATOR MOTOR)
M3 (CARRIER MOTOR)
M4 (SPINDLE MOTOR)
CNJ902
To C C.P.U C.B CNP201
CNJ909
To SERVO C.B CNP108
CNJ903
To C.P.U C.B CNP215
SOL1
PL1
CNJ904
To P POWER C.B CNP501
CNJ905
To P POWER C.B CNP502
CNJ910
To A SERVO C.B CNP102
CNP913
To PU Ass'y
CNJ911
To A SERVO C.B CNP103
CNP914
To PU Ass'y
CNJ912
To A SERVO C.B CNP101
PU Ass'

rts side pattern ▨ Others pattern

ge is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.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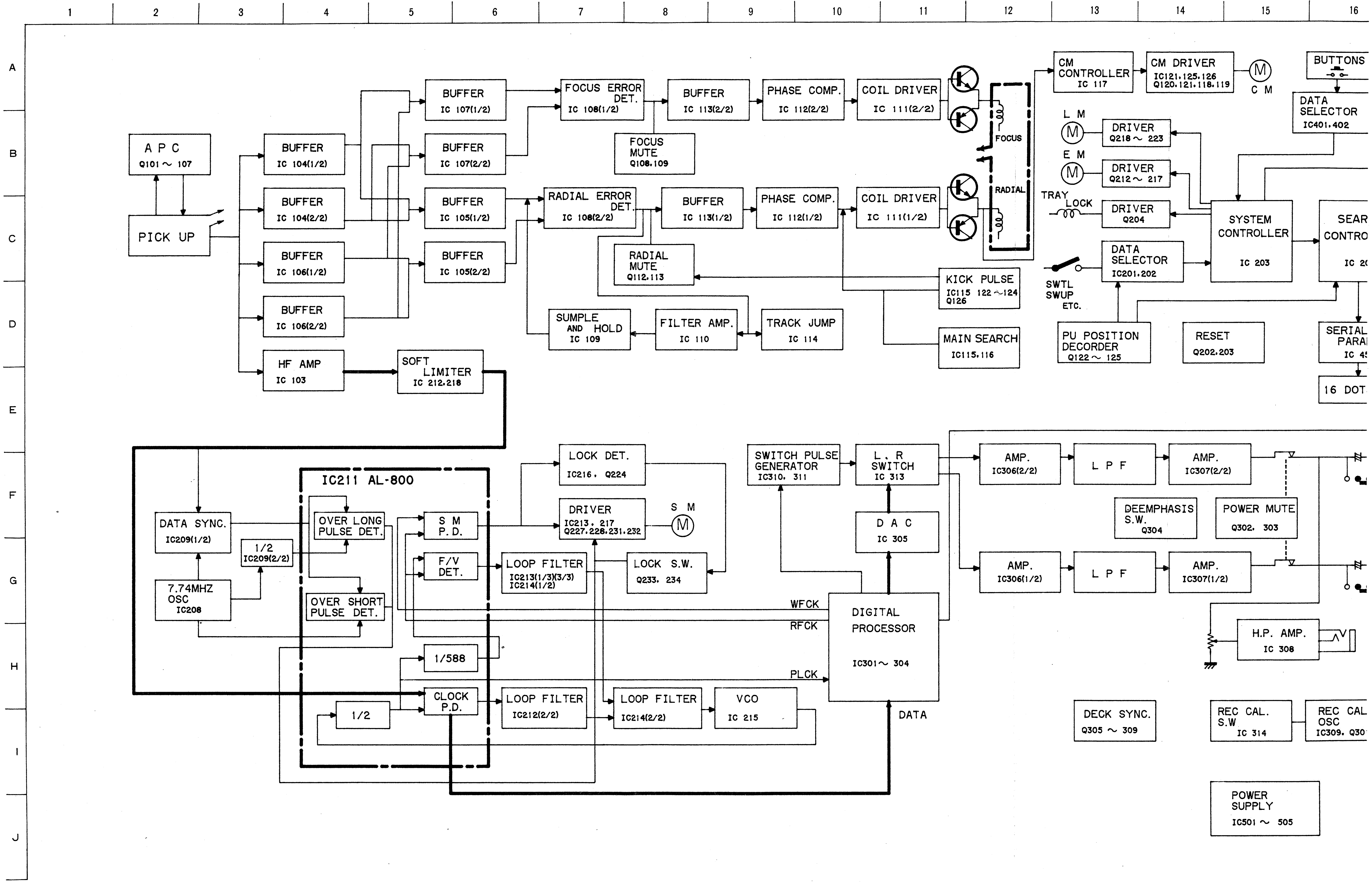
IC401
IC403
IC402
IC404
CNJ401
To C C.P.U C.B CNP208
S402,D405 PLAY
S404,D406 PAUSE
S408,D413 REC CAL
S409,D411 REPEAT
S413 ALL CLEAR
S412 SET
S406,D412 INTRO PLAY
S401,D408 SF/FF
S410,D410 PROGRAM MODE
S411 MEMORY INC
K LED-2 C.B
D3
(TRACK NO DISPLAY)
N PH.TR. C.B
Q3
CNJ906
To C C.P.U C.B CNP205
M LED-3 C.B
D9
CNJ907
To C C.P.U C.B CNP206
L SWITCH-1 C.B
S5
S5 TIMER PLAY
CNJ908
To C C.P.U C.B CNP204
-2 C.B
D1 PROGRAM MEMORY INDICATOR
JP-1
C C.P.U C.B
F LEAD C.B
D464
D465
IC451
IC452
IC453
IC454
IC456
IC457
CNJ451
To C C.P.U CNP209
CNJ452
To C C.P.U CNP211
S2 (TRAY EJECT)
S1 (TRAY LOCK)
S4 (ELEVATOR UP)
S3 (ELEVATOR DOWN)
CNJ901
To C C.P.U C.B CN203
M2 (LOADING MOTOR)
M1 (ELEVATOR MOTOR)
M3 (CARRIER MOTOR)
M4 (SPINDLE MOTOR)
CNJ902
To C C.P.U C.B CNP201
CNJ909
To SERVO C.B CNP108
CNJ903
To C.P.U C.B CNP215
SOL1
PL1
CNJ904
To P POWER C.B CNP501
CNJ905
To P POWER C.B CNP502
CNJ910
To A SERVO C.B CNP102
CNP913
To PU Ass'y
CNJ911
To A SERVO C.B CNP103
CNP914
To PU Ass'y
CNJ912
To A SERVO C.B CNP101
PU Ass'y
From A SERVO C.B CNP913
CNJ991
CNJ994
From A SERVO C.B CNP914

BLOCK DIAGRAM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A
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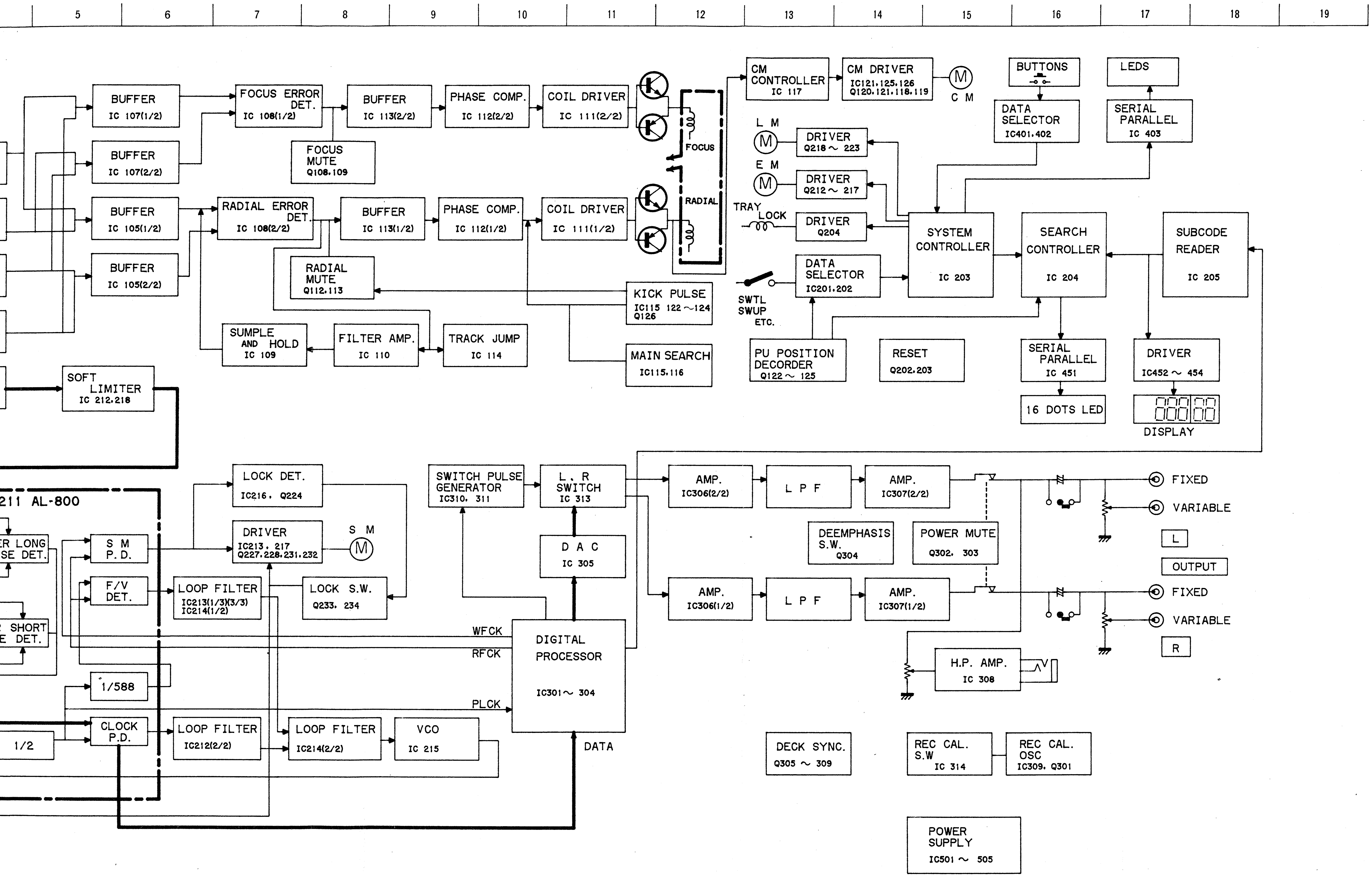
C
D
E
F
G
H
I
J
A P C
Q101 ~ 107
PICK UP
BUFFER
IC 104(1/2)
BUFFER
IC 104(2/2)
BUFFER
IC 106(1/2)
BUFFER
IC 106(2/2)
HF AMP
IC 103
SOFT LIMITER
IC 212.218
BUFFER
IC 107(1/2)
BUFFER
IC 107(2/2)
BUFFER
IC 105(1/2)
BUFFER
IC 105(2/2)
FOCUS ERROR DET.
IC 108(1/2)
FOCUS MUTE
Q108.109
RADIAL ERROR DET.
IC 108(2/2)
RADIAL MUTE
Q112.113
SUMPLE AND HOLD
IC 109
FILTER AMP.
IC 110
TRACK JUMP
IC 114
BUFFER
IC 113(2/2)
BUFFER
IC 113(1/2)
PHASE COMP.
IC 112(2/2)
PHASE COMP.
IC 112(1/2)
COIL DRIVER
IC 111(2/2)
COIL DRIVER
IC 111(1/2)
FOCUS
RADIAL
KICK PULSE
IC115 122~124 Q126
MAIN SEARCH
IC115.116
CM CONTROLLER
IC 117
CM DRIVER
IC121.125.126 Q120.121.118.119
C M
L M
E M
DRIVER
Q218 ~ 223
DRIVER
Q212 ~ 217
TRAY LOCK
DRIVER
Q204
SWTL SWUP ETC.
DATA SELECTOR
IC201.202
PU POSITION DECORDER
Q122 ~ 125
RESET
Q202.203
SYSTEM CONTROLLER
IC 203
BUTTONS
DATA SELECTOR
IC401.402
SEAR
CONTRO
IC 20
SERIAL PARA
IC 45
16 DOT
DATA SYNC.
IC209(1/2)
1/2
IC209(2/2)
7.74MHZ OSC
IC208
IC211 AL-800
OVER LONG PULSE DET.
OVER SHORT PULSE DET.
S M P. D.
F/V DET.
1/588
CLOCK P.D.
1/2
LOCK DET.
IC216. Q224
DRIVER
IC213. 217 Q227.228.231.232
S M
LOOP FILTER
IC213(1/3)(3/3) IC214(1/2)
LOCK S.W.
Q233. 234
LOOP FILTER
IC212(2/2)
LOOP FILTER
IC214(2/2)
VCO
IC 215
WFCK
RFCK
PLCK
DATA
DIGITAL PROCESSOR
IC301 ~ 304
SWITCH PULSE GENERATOR
IC310. 311
L . R SWITCH
IC 313
D A C
IC 305
AMP.
IC306(2/2)
AMP.
IC306(1/2)
L P F
L P F
AMP.
IC307(2/2)
AMP.
IC307(1/2)
DEEMPHASIS S.W.
Q304
POWER MUTE
Q302. 303
H.P. AMP.
IC 308
DECK SYNC.
Q305 ~ 309
REC CAL. S.W
IC 314
REC CAL OSC
IC309. Q30
POWER SUPPLY
IC501 ~ 505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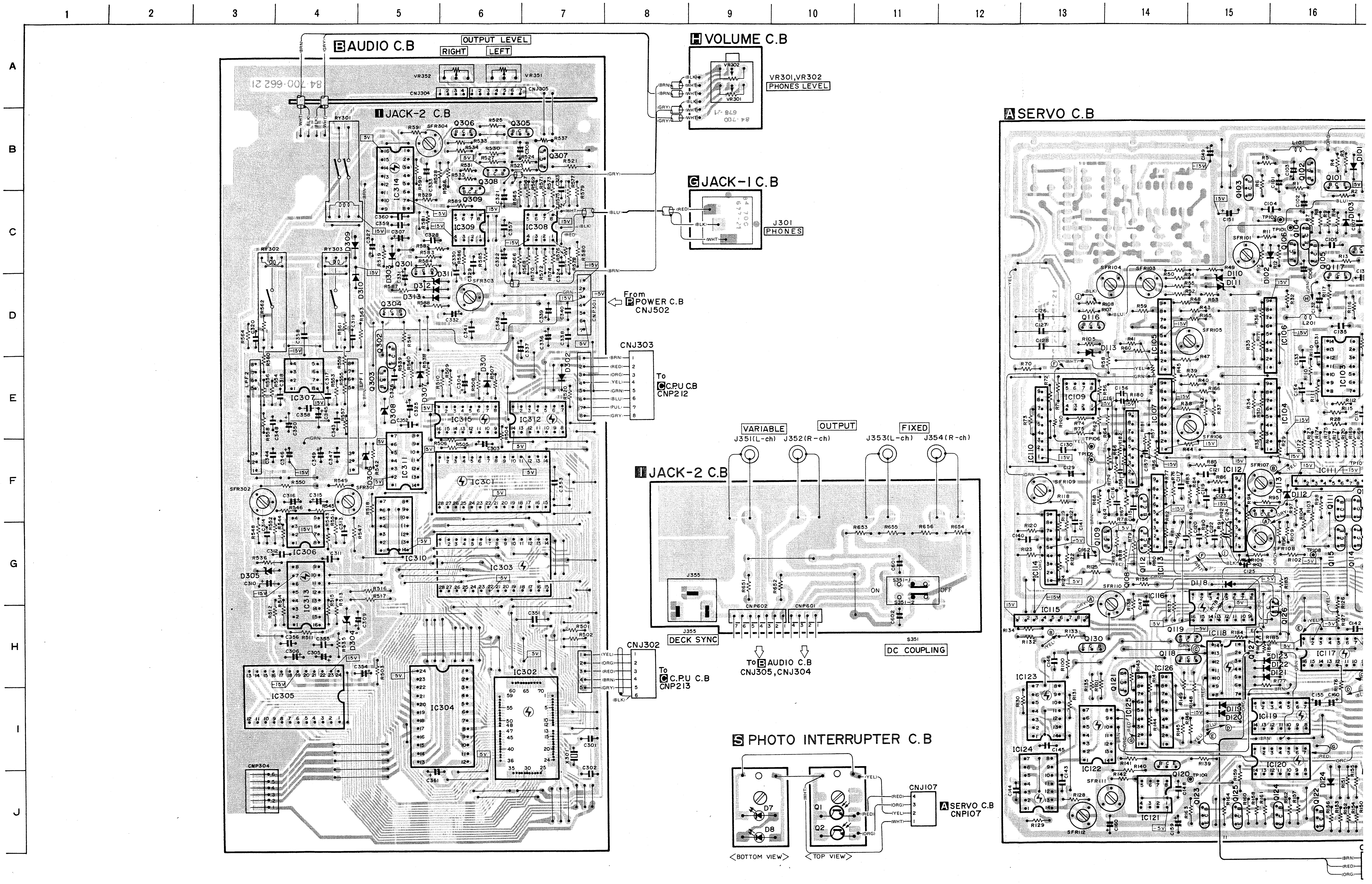
BUFFER IC 107(1/2)
BUFFER IC 107(2/2)
BUFFER IC 105(1/2)
BUFFER IC 105(2/2)
FOCUS ERROR DET. IC 108(1/2)
FOCUS MUTE Q108.109
RADIAL ERROR DET. IC 108(2/2)
RADIAL MUTE Q112.113
BUFFER IC 113(2/2)
BUFFER IC 113(1/2)
PHASE COMP. IC 112(2/2)
PHASE COMP. IC 112(1/2)
COIL DRIVER IC 111(2/2)
COIL DRIVER IC 111(1/2)
FOCUS
RADIAL
KICK PULSE IC115 122～124 Q126
MAIN SEARCH IC115.116
SUMPLE AND HOLD IC 109
FILTER AMP. IC 110
TRACK JUMP IC 114
SOFT LIMITER IC 212.218
CM CONTROLLER IC 117
CM DRIVER IC121.125.126 Q120.121.118.119
C M
L M
E M
DRIVER Q218～223
DRIVER Q212～217
TRAY LOCK
DRIVER Q204
SWTL SWUP ETC.
DATA SELECTOR IC201.202
PU POSITION DECORDER Q122～125
RESET Q202.203
BUTTONS
DATA SELECTOR IC401.402
LEDS
SERIAL PARALLEL IC 403
SYSTEM CONTROLLER IC 203
SEARCH CONTROLLER IC 204
SUBCODE READER IC 205
SERIAL PARALLEL IC 451
16 DOTS LED
DRIVER IC452～454
DISPLAY
211 AL-800
ER LONG SE DET.
SHORT E DET.
S M P. D.
F/V DET.
1/588
1/2
CLOCK P.D.
LOCK DET. IC216. Q224
DRIVER IC213. 217 Q227.228.231.232
S M
LOOP FILTER IC213(1/3)(3/3) IC214(1/2)
LOCK S.W. Q233. 234
LOOP FILTER IC212(2/2)
LOOP FILTER IC214(2/2)
VCO IC 215
SWITCH PULSE GENERATOR IC310. 311
L. R SWITCH IC 313
D A C IC 305
WFCK
RFCK
PLCK
DIGITAL PROCESSOR IC301～304
DATA
AMP. IC306(2/2)
AMP. IC306(1/2)
L P F
L P F
AMP. IC307(2/2)
AMP. IC307(1/2)
DEEMPHASIS S.W. Q304
POWER MUTE Q302. 303
FIXED
VARIABLE
L
OUTPUT
FIXED
VARIABLE
R
H.P. AMP. IC 308
DECK SYNC. Q305～309
REC CAL. S.W IC 314
REC CAL. OSC IC309. Q301
POWER SUPPLY IC501～505

NOTES (1) ▨ Others pattern

(2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.

WIRING—1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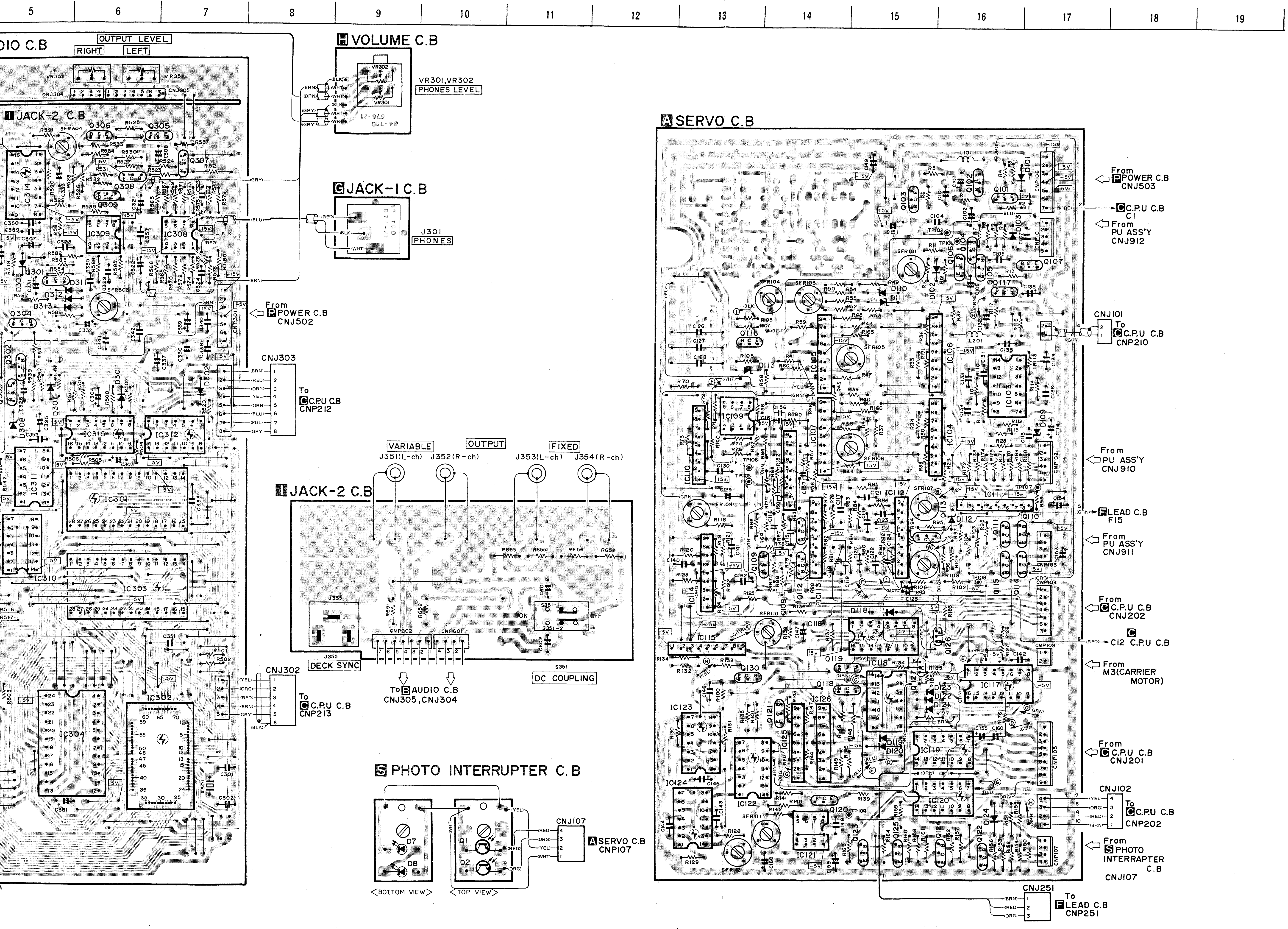
I
J
B AUDIO C.B
OUTPUT LEVEL
RIGHT
LEFT
VR352
VR351
CNJ304
CNJ305
I JACK-2 C.B
RY301
RY302
RY303
IC314
IC309
IC308
IC307
IC315
IC312
IC311
IC301
IC306
IC310
IC303
IC313
IC305
IC304
IC302
CNP304
H VOLUME C.B
VR302
VR301
VR301, VR302
PHONES LEVEL
G JACK-1 C.B
J301
PHONES
From
P POWER C.B
CNJ502
CNP301
CNJ303
To
C C.P.U C.B
CNP212
CNJ302
To
C C.P.U C.B
CNP213
VARIABLE
OUTPUT
FIXED
J351 (L-ch)
J352 (R-ch)
J353 (L-ch)
J354 (R-ch)
I JACK-2 C.B
J355
DECK SYNC
CNP602
CNP601
S351
DC COUPLING
ON
OFF
To B AUDIO C.B
CNJ305, CNJ304
S PHOTO INTERRUPTER C.B
D7
D8
Q1
Q2
<BOTTOM VIEW>
<TOP VIEW>
CNJ107
A SERVO C.B
CNP107
A SERVO C.B
IC101
IC103
IC104
IC105
IC106
IC107
IC109
IC110
IC111
IC112
IC113
IC114
IC115
IC116
IC117
IC118
IC119
IC120
IC121
IC122
IC123
IC124
IC125
IC126

Others pattern
voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.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DIO C.B
OUTPUT LEVEL
RIGHT
LEFT
VR352
VR351
CNJ304
CNJ305
I JACK-2 C.B
IC314
IC309
IC308
IC315
IC312
IC311
IC301
IC310
IC303
IC304
IC302
From P POWER C.B CNJ502
CNJ303
To C C.PU C.B CNP212
CNJ302
To C C.PU C.B CNP213
H VOLUME C.B
VR301,VR302
PHONES LEVEL
G JACK-1 C.B
J301
PHONES
VARIABLE
OUTPUT
FIXED
J351(L-ch)
J352(R-ch)
J353(L-ch)
J354(R-ch)
I JACK-2 C.B
J355
DECK SYNC
CNP602
CNP601
ON
OFF
S351
DC COUPLING
To B AUDIO C.B
CNJ305, CNJ304
S PHOTO INTERRUPTER C.B
D7
D8
Q1
Q2
<BOTTOM VIEW>
<TOP VIEW>
CNJ107
A SERVO C.B
CNP107
A SERVO C.B
From P POWER C.B CNJ503
C C.P.U C.B C1
From PU ASS'Y CNJ912
CNJ101
To C C.P.U C.B CNP210
From PU ASS'Y CNJ910
F LEAD C.B F15
From PU ASS'Y CNJ911
From C C.P.U C.B CNJ202
C C12 C.P.U C.B
From M3(CARRIER MOTOR)
From C C.P.U C.B CNJ201
CNJ102
To C C.P.U C.B CNP202
From S PHOTO INTERRAPTER C.B CNJ107
CNJ251
To F LEAD C.B CNP251

AIWA®

ELECTRICAL MAIN PARTS LIST

≪SERVO CIRCUIT BOARD SECTION≫

Symbol No.	Part No.	Description
PCB-A	*	SERVO circuit board
IC103	87-027-959-01	IC, μPC4359C
IC104, 105, 106, 107, 108, 110, 111, 112, 113, 114, 115, 126	87-027-939-01	IC, NJM4558S
IC109	87-027-960-01	IC, μPC649
⚡IC116	87-027-938-01	IC, TC4053BP
⚡IC117	87-027-958-01	IC, TC4051BP
⚡IC118, 119	87-027-976-01	IC, TC4001BP
⚡IC120	87-027-980-01	IC, TC7404UBP
IC121	87-027-961-01	IC, NJM555D
⚡IC122	87-027-937-01	IC, TC4030BP
⚡IC123, 124	87-027-564-01	IC, CMOS TC4011BP
IC125	87-027-940-01	IC, NJM2903S
Q101, 104, 106, 109, 119, 120, 121	89-110-154-01	Transistor, 2SA1015(Y)
Q102, 103, 105, 108, 112, 113, 116, 117, 118, 122, 123, 124, 125, 126, 127, 130	89-318-154-01	Transistor, 2SC1815(Y)
Q107, 110, 114	89-318-464-01	Transistor, 2SC1846(R)
Q111, 115	89-108-854-01	Transistor, 2SA885(R)
D101, 102, 103, 118, 119, 120, 121, 122, 123, 124, 125	87-027-097-01	Diode, 1S1555
D109	87-027-346-01	Zener diode, HZ11A2L
D110, 111	87-027-332-01	Zener diode, HZ6B1L
D112, 113	87-027-301-01	Zener diode, HZ3A1
L101, 201	87-005-121-01	Choke coil, 2.2μH
SFR101	87-021-406-01	Semi-fixed resistor, 4.7kΩ-B
SFR102	87-021-767-01	Semi-fixed resistor, 47kΩ-B
SFR103, 104, 109	87-021-421-01	Semi-fixed resistor, 1 kΩ-B
SFR105, 106, 107, 108	87-021-366-01	Semi-fixed resistor, 10kΩ-B
SFR110	87-021-440-01	Semi-fixed resistor, 220kΩ-B
SFR111, 112	87-021-367-01	Semi-fixed resistor, 100kΩ-B
CNJ101	84-700-635-01	Connector ass'y, 2P
CNJ102	84-700-636-01	Connector ass'y, 4P
CNJ251	84-700-708-01	Connector ass'y, 3P
CNP101	84-700-688-02	Pin, 5P
CNP102	84-700-689-01	Pin, 6P
CNP103, 107	84-700-687-01	Pin, 4P
CNP104	84-700-691-01	Pin, 7P
CNP105	84-700-709-01	Pin, 9P
CNP106	87-049-147-01	Pin, 7P
CNP108	84-700-684-01	Pin, 2P
		<Capacitors>
C125	87-015-455-01	10μF 25V Electrolytic BP
C126, 127, 128, 156, 162	87-014-168-01	2.2μF 63V PP
C129	87-015-668-01	22μF 16V Electrolytic BP
C147	87-015-453-01	2.2μF 25V Electrolytic BP
C170	87-014-167-01	1μF PP

≪AUDIO CIRCUIT BOARD SECTION≫

Symbol No.	Part No.	Description
PCB-B	*	Audio circuit board
⚡IC301	87-027-929-01	IC, CX7933
⚡IC302	87-027-930-01	IC, CX7934
⚡IC303	87-027-931-01	IC, CX7935
IC304	87-027-962-01	IC, TMM2016P-2
IC305	87-027-932-01	IC, PCM-53
IC306, 307	87-027-963-01	IC, NJM072D
IC308	87-027-739-01	IC, NJM4556D
IC309	87-027-235-01	IC, NJM4558D
IC310	87-027-979-01	IC, 74LS26N
IC311	87-027-956-01	IC, SN74LS91N
IC312	87-027-980-01	IC, TC7404UBP
IC313, 314	87-027-938-01	IC, TC4053BP
IC315	87-027-616-01	IC, TC4050BP
Q301	89-500-302-01	FET, 2SK30A (R)
Q302, 303, 304	89-318-155-01	Transistor, 2SC1815 (GR)
Q305, 307, 309	89-318-154-01	Transistor, 2SC1815 (Y)
Q306, 308	89-110-154-01	Transistor, 2SA1015 (Y)
D301, 302, 303, 307, 309	87-027-097-01	Diode, 1S1555
D304, 305	87-027-606-01	Zener diode, HZ7C2L
D308	87-027-405-01	Zener diode, RD2.2EB
D311	87-027-256-01	Zener diode, RD2.7E
D312, 313	87-027-253-01	Diode, M8513A-AIWA
LPF1,2	87-008-263-01	Low-pass filter, F110B
RY301	87-045-199-01	Lead relay, L23 (12V)
RY302, 303	87-045-206-01	Lead relay, L13 (12V)
X301	87-030-088-01	Crystal resonator X'TAL 8.6436 MHz
VR351, 352	87-021-761-01	Volume, 3kΩ-A (OUTPUT LEVEL)
SFR301, 302	87-021-421-01	Semi-fixed resistor, 1kΩ-B
SFR303, 304	87-021-406-01	Semi-fixed resistor, 4.7kΩ-B
CNJ302	84-700-637-11	Connector ass'y, 6P
CNJ303	84-700-638-01	Connector ass'y, 8P
CNP301	87-049-147-01	Pin, 7P
CNP304	84-700-690-01	Pin, 6P
		<Resistors>
R555, 556	87-025-283-01	12kΩ 1/4W Metal film
R559, 560	87-025-277-01	2.2kΩ 1/4W Metal film
R561, 562	87-025-305-01	33kΩ 1/4W Metal film
		<Capacitors>
C317, 318	87-014-045-01	330pF PP
C319, 320	87-014-169-01	1500pF PP
C333	87-015-455-01	10μF 25V Electrolytic BP
C345, 346, 349, 350	87-015-171-01	100μF 50V Electrolytic

≪CPU CIRCUIT BOARD SECTION≫

Symbol No.	Part No.	Description
PCB-C	*	Center processing unit circuit board
IC210, 202	87-027-966-01	IC, SN74LS151N
⚡IC203	84-700-620-01	LSI, LM6402A-152
⚡IC204	84-700-619-01	LSI, HD6805U1-A08
⚡IC205	84-700-618-01	LSI, HD6805SI-A10
⚡IC206	87-027-976-01	IC, TC4001BP
IC207	87-027-564-01	IC, CMOS TC4011BP
IC208	87-027-969-01	IC, SN74LS00N
IC209	87-027-968-01	IC, SN74LS74AN
⚡IC211	87-027-892-01	LSI, AL-800
IC212, 217	87-027-235-01	IC, NJM-4558D
⚡IC213	87-027-938-01	IC, TC4053BP
IC214	87-027-970-01	IC, NJM2043D
IC215	87-027-967-01	IC, SN74LS624N
⚡IC216	87-027-980-01	IC, TC7404UBP
Q201, 203, 205, 207, 208, 210, 211, 224, 226, 230, 233, 234, 235	89-318-154-01	Transistor, 2SC1815 (Y)
Q202, 204, 206, 209, 212, 214, 218, 220, 225, 227, 228	89-110-154-01	Transistor 2SA1015 (Y)
Q213, 215, 219, 221	89-109-521-01	Transistor, 2SA952K
Q216, 217, 222, 223	89-320-011-01	Transistor, 2SC2001K
Q229	89-500-307-01	FET, 2SK30A (GR)
Q231	89-309-954-01	Transistor, 2SC495 (Y)
Q232	89-105-054-01	Transistor, 2SA505 (Y)
D201, 202 203, 204, 205, 206, 207, 208, 210, 211, 212, 213, 214, 215, 217, 218, 221	87-027-097-01	Diode, 1S1555
D209, 222, 223	87-027-332-01	Zener diode, HZ6B1L
D216	87-027-301-01	Zener diode, HZ3A1
D219	87-027-416-01	Zener diode, HZ3C2
D220	87-027-555-01	Zener diode, HZ5C2
CF201	87-008-236-01	Ceramic resonator, CSB400P
X201	87-030-088-01	Crystal resonator X'TAL 8.6436 MHz
X202	87-030-089-01	Crystal resonator 7.74 MHz
SFR201	87-021-438-01	Semi-fixed resistor, 6.8kΩ-B
SFR202	87-021-767-01	Semi-fixed resistor, 47kΩ-B
CNJ201	84-700-640-11	Connector ass'y, 9P
CNJ202	84-700-639-01	Connector ass'y, 7P
CNP201, 202	84-700-687-01	Pin, 4P
CNP203, 212	84-700-692-01	Pin, 8P
CNP204	84-700-685-01	Pin, 2P
CNP205, 206, 210, 215	84-700-684-01	Pin, 2P
CNP208	84-700-693-01	Pin, 8P
CNP209	84-700-686-01	Pin, 3P
CNP211	84-700-694-01	Pin, 15P
CNP213	84-700-689-01	Pin, 6P
CNP214	87-049-158-01	Pin, 7P
		<Resistors>
CP201-1 ~8	84-700-681-01	22kΩ X 8 Block resistor
CP201-1 ~12	84-700-683-01	22kΩ X 12 Block resistor
CP203-1 ~9	84-700-682-01	22kΩ X 9 Block resistor
R320	87-025-069-01	22Ω 1W Metal film
		<Capacitor>
C220	87-015-991-01	47μF 16V Tantalum

≪INDICATOR-1 CIRCUIT BOARD SECTION≫

Symbol No.	Part No.	Description
PCB-D	*	Indicator-1 circuit board
IC401, 402	87-027-966-01	IC, SN74LS151N
IC403	87-027-936-01	IC, MSM58371RS
⚡IC404	87-027-564-01	IC, CMOS TC4011BP
D401, 404	87-027-097-01	Diode, 1S1555
D405, 408, 409, 410, 411, 412	87-027-543-01	LED, LN317GP
D406	87-027-671-01	LED, LN417YP
D407, 413	87-027-542-01	LED, LN217RP
S401, 403	87-031-757-01	Tact switch (SF/FF, SR/FR)
S402, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414	87-031-642-01	Tact switch (PLAY, PAUSE, RETURN, STOP, INTROPLAY, LOAD/EJECT, REC CAL, REPEAT, PROGRAM MODE, MEMORY INC, SET, ALL CLEAR, TIME DISPLAY)
CNJ401	84-700-642-01	Connector ass'y, 8P

≪DRIVER CIRCUIT BOARD SECTION≫

Symbol No.	Part No.	Description
PCB-E	*	Driver circuit board
IC451	87-027-935-01	IC, MSM59371RS
IC452	87-027-957-01	IC, BA618
⚡IC453	87-027-657-01	IC, TC4028BP
IC454	87-027-426-01	IC, IR-2403
⚡IC455, 456, 457	87-027-564-01	IC, CMOS TC4011BP
Q451	89-110-154-01	Transistor, 2SA1015 (Y)
Q452, 453, 454	89-318-154-01	Transistor, 2SC1815 (Y)
D451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 464, 465, 466, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478	87-027-097-01	Diode, 1S1555
CNJ451	84-700-641-01	Connector ass'y, 3P
CNJ452	84-700-643-01	Connector ass'y, 15P
CNJ453	84-700-644-01	Connector ass'y, 15P

≪LEAD CIRCUIT BOARD SECTION≫

Symbol No.	Part No.	Description
PCB-F	*	Lead circuit board
⚡IC251	87-027-564-01	IC, CMOS TC4011BP
⚡IC252	87-027-976-01	IC, TC4001BP

Symbol No.	Par
⚡IC253	87-02
⚡IC254	87-02
⚡IC255	87-02
IC256	87-02
Q251, 252	89-31
D251, 252, 253, 254, 256, 257	87-02
D255	87-02
CNP251	84-70

≪JACK-1 CIRCUI

Symbol No.	Par
PCB-G	
J301	82-16

≪VOLUME CIRCU

Symbol No.	Par
PCB-H	84-70
VR301, 302	87-02

≪JACK-2 CIRCUI

Symbol No.	Par
PCB-I	84-70
J351, 352, 353, 354, 355, S351	84-70
CNP601	87-04
CNP602	87-04
C601, 602	87-01

≪LED-1 CIRCUIT

Symbol No.	Par
PCB-J	
D2	87-02

≪LED-2 CIRCUIT

Symbol No.	Par
PCB-K	
D3	87-02

≪SWITCH-1 CIRC

Symbol No.	Par
PCB-L	
S5	87-0
CNJ908	84-7

≪LED-3 CIRCUIT

Symbol No.	Par
PCB-M	
D9	87-0
CNJ907	84-7

≪PH, TR CIRCU

Symbol No.	Par
PCB-N	84-7
Q3	87-0
CNJ906	84-7

≪SWITCH-2 CIRC

Symbol No.	Par
⚠PCB-0	84-7
⚠S551	87-0
⚠NF551	87-0
	82-3
⚠C551, 552	87-0

Symbol No.	Part No.	Description
C126, 127, 128, 156, 162	87-014-168-01	2.2μF 63V PP
C129	87-015-668-01	22μF 16V Electrolytic BP
C147	87-015-453-01	2.2μF 25V Electrolytic BP
C170	87-014-167-01	1μF PP

≪AUDIO CIRCUIT BOARD SECTION≫

PCB-B	*	Audio circuit board
IC301	87-027-929-01	IC, CX7933
IC302	87-027-930-01	IC, CX7934
IC303	87-027-931-01	IC, CX7935
IC304	87-027-962-01	IC, TMM2016P-2
IC305	87-027-932-01	IC, PCM-53
IC306, 307	87-027-963-01	IC, NJM072D
IC308	87-027-739-01	IC, NJM4556D
IC309	87-027-235-01	IC, NJM4558D
IC310	87-027-979-01	IC, 74LS26N
IC311	87-027-956-01	IC, SN74LS91N
IC312	87-027-980-01	IC, TC7404UBP
IC313, 314	87-027-938-01	IC, TC4053BP
IC315	87-027-616-01	IC, TC4050BP
Q301	89-500-302-01	FET, 2SK30A (R)
Q302, 303, 304	89-318-155-01	Transistor, 2SC1815 (GR)
Q305, 307, 309	89-318-154-01	Transistor, 2SC1815 (Y)
Q306, 308	89-110-154-01	Transistor, 2SA1015 (Y)
D301, 302, 303, 307, 309	87-027-097-01	Diode, 1S1555
D304, 305	87-027-606-01	Zener diode, HZ7C2L
D308	87-027-405-01	Zener diode, RD2.2EB
D311	87-027-256-01	Zener diode, RD2.7E
D312, 313	87-027-253-01	Diode, M8513A-AIWA
LPF1,2	87-008-263-01	Low-pass filter, F110B
RY301	87-045-199-01	Lead relay, L23 (12V)
RY302, 303	87-045-206-01	Lead relay, L13 (12V)
X301	87-030-088-01	Crystal resonator X'TAL 8.6436 MHz
VR351, 352	87-021-761-01	Volume, 3kΩ-A (OUTPUT LEVEL)
SFR301, 302	87-021-421-01	Semi-fixed resistor, 1kΩ-B
SFR303, 304	87-021-406-01	Semi-fixed resistor, 4.7kΩ-B
CNJ302	84-700-637-11	Connector ass'y, 6P
CNJ303	84-700-638-01	Connector ass'y, 8P
CNP301	87-049-147-01	Pin, 7P
CNP304	84-700-690-01	Pin, 6P
		<Resistors>
R555, 556	87-025-283-01	12kΩ 1/4W Metal film
R559, 560	87-025-277-01	2.2kΩ 1/4W Metal film
R561, 562	87-025-305-01	33kΩ 1/4W Metal film
		<Capacitors>
C317, 318	87-014-045-01	330pF PP
C319, 320	87-014-169-01	1500pF PP
C333	87-015-455-01	10μF 25V Electrolytic BP
C345, 346, 349, 350	87-015-171-01	100μF 50V Electrolytic

≪CPU CIRCUIT BOARD SECTION≫

Symbol No.	Part No.	Description
PCB-C	*	Center processing unit circuit board
IC210, 202	87-027-966-01	IC, SN74LS151N
⚡IC203	84-700-620-01	LSI, LM6402A-152
⚡IC204	84-700-619-01	LSI, HD6805U1-A08
⚡IC205	84-700-618-01	LSI, HD6805SI-A10
⚡IC206	87-027-976-01	IC, TC4001BP
IC207	87-027-564-01	IC, CMOS TC4011BP
IC208	87-027-969-01	IC, SN74LS00N
IC209	87-027-968-01	IC, SN74LS74AN
⚡IC211	87-027-892-01	LSI, AL-800
IC212, 217	87-027-235-01	IC, NJM-4558D
⚡IC213	87-027-938-01	IC, TC4053BP
IC214	87-027-970-01	IC, NJM2043D
IC215	87-027-967-01	IC, SN74LS624N
⚡IC216	87-027-980-01	IC, TC7404UBP
Q201, 203, 205, 207, 208, 210, 211, 224, 226, 230, 233, 234, 235	89-318-154-01	Transistor, 2SC1815 (Y)
Q202, 204, 206, 209, 212, 214, 218, 220, 225, 227, 228	89-110-154-01	Transistor 2SA1015 (Y)
Q213, 215, 219, 221	89-109-521-01	Transistor, 2SA952K
Q216, 217, 222, 223	89-320-011-01	Transistor, 2SC2001K
Q229	89-500-307-01	FET, 2SK30A (GR)
Q231	89-309-954-01	Transistor, 2SC495 (Y)
Q232	89-105-054-01	Transistor, 2SA505 (Y)
D201, 202 203, 204, 205, 206, 207, 208, 210, 211, 212, 213, 214, 215, 217, 218, 221	87-027-097-01	Diode, 1S1555
D209, 222, 223	87-027-332-01	Zener diode, HZ6B1L
D216	87-027-301-01	Zener diode, HZ3A1
D219	87-027-416-01	Zener diode, HZ3C2
D220	87-027-555-01	Zener diode, HZ5C2
CF201	87-008-236-01	Ceramic resonator, CSB400P
X201	87-030-088-01	Crystal resonator X'TAL 8.6436 MHz
X202	87-030-089-01	Crystal resonator 7.74 MHz
SFR201	87-021-438-01	Semi-fixed resistor, 6.8kΩ-B
SFR202	87-021-767-01	Semi-fixed resistor, 47kΩ-B
CNJ201	84-700-640-11	Connector ass'y, 9P
CNJ202	84-700-639-01	Connector ass'y, 7P
CNP201, 202	84-700-687-01	Pin, 4P
CNP203, 212	84-700-692-01	Pin, 8P
CNP204	84-700-685-01	Pin, 2P
CNP205, 206, 210, 215	84-700-684-01	Pin, 2P
CNP208	84-700-693-01	Pin, 8P
CNP209	84-700-686-01	Pin, 3P
CNP211	84-700-694-01	Pin, 15P
CNP213	84-700-689-01	Pin, 6P
CNP214	87-049-158-01	Pin, 7P
		<Resistors>
CP201-1 ~ 8	84-700-681-01	22kΩ X 8 Block resistor
CP201-1 ~ 12	84-700-683-01	22kΩ X 12 Block resistor
CP203-1 ~ 9	84-700-682-01	22kΩ X 9 Block resistor
R320	87-025-069-01	22Ω 1W Metal film
		<Capacitor>
C220	87-015-991-01	47μF 16V Tantalum

≪INDICATOR-1 CIRCUIT BOARD SECTION≫

PCB-D	*	Indicator-1 circuit board
IC401, 402	87-027-966-01	IC, SN74LS151N
IC403	87-027-936-01	IC, MSM58371RS
⚡IC404	87-027-564-01	IC, CMOS TC4011BP
D401, 404	87-027-097-01	Diode, 1S1555
D405, 408, 409, 410, 411, 412	87-027-543-01	LED, LN317GP
D406	87-027-671-01	LED, LN417YP
D407, 413	87-027-542-01	LED, LN217RP
S401, 403	87-031-757-01	Tact switch (SF/FF, SR/FR)
S402, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414	87-031-642-01	Tact switch (PLAY, PAUSE, RETURN, STOP, INTROPLAY, LOAD/EJECT, REC CAL, REPEAT, PROGRAM MODE, MEMORY INC, SET, ALL CLEAR, TIME DISPLAY)
CNJ401	84-700-642-01	Connector ass'y, 8P

≪DRIVER CIRCUIT BOARD SECTION≫

PCB-E	*	Driver circuit board
IC451	87-027-935-01	IC, MSM59371RS
IC452	87-027-957-01	IC, BA618
⚡IC453	87-027-657-01	IC, TC4028BP
IC454	87-027-426-01	IC, IR-2403
⚡IC455, 456, 457	87-027-564-01	IC, CMOS TC4011BP
Q451	89-110-154-01	Transistor, 2SA1015 (Y)
Q452, 453, 454	89-318-154-01	Transistor, 2SC1815 (Y)
D451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 464, 465, 466, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478	87-027-097-01	Diode, 1S1555
CNJ451	84-700-641-01	Connector ass'y, 3P
CNJ452	84-700-643-01	Connector ass'y, 15P
CNJ453	84-700-644-01	Connector ass'y, 15P

≪LEAD CIRCUIT BOARD SECTION≫

Symbol No.	Part No.	Description
PCB-F	*	Lead circuit board
⚡IC251	87-027-564-01	IC, CMOS TC4011BP
⚡IC252	87-027-976-01	IC, TC4001BP
⚡IC253	87-027-991-01	IC, TC4013BP
⚡IC254	87-027-992-01	IC, TC4073BP
⚡IC255	87-027-827-01	IC, TC4069UBP
IC256	87-027-961-01	IC, NJM555D
Q251, 252	89-318-154-01	Transistor, 2SC1815 (Y)
D251, 252, 253, 254, 256, 257	87-027-097-01	Diode, 1S1555
D255	87-027-301-01	Zener diode, HZ3A1
CNP251	84-700-686-01	Pin, 3P

≪JACK-1 CIRCUIT BOARD SECTION≫

PCB-G	*	Jack-1 circuit board
J301	82-168-633-01	Jack, 6.3ϕ (PHONES)

≪VOLUME CIRCUIT BOARD SECTION≫

PCB-H	84-700-678-21	Volume circuit board
VR301, 302	87-021-760-01	Volume, 10kΩ-A (PHONES LEVEL)

≪JACK-2 CIRCUIT BOARD SECTION≫

PCB-I	84-700-671-21	Jack-2 circuit board
J351, 352, 353, 354, 355, S351	84-700-740-01	Pin jack ass'y (OUTPUT, DECK SYNC, DC COUPLING)
CNP601	87-049-114-01	Pin, 4P
CNP602	87-049-117-01	Pin, 7P
		<Capacitor>
C601, 602	87-015-457-01	47μF 16V Electrolytic BP

≪LED-1 CIRCUIT BOARD SECTION≫

PCB-J	*	LED-1 circuit board
D2	87-027-613-01	LED, TLG4125

≪LED-2 CIRCUIT BOARD SECTION≫

PCB-K	*	LED-2 circuit board
D3	87-027-965-01	LED, TLG-322

≪SWITCH-1 CIRCUIT BOARD SECTION≫

PCB-L	*	Switch circuit board
S5	87-031-759-01	Push switch (TIMER PLAY)
CNJ908	84-700-702-01	Connector ass'y, 2P

≪LED-3 CIRCUIT BOARD SECTION≫

PCB-M	*	LED-3 circuit board
D9	87-027-817-01	LED, TLN-103
CNJ907	84-700-649-01	Connector ass'y, 2P

≪PH, TR CIRCUIT BOARD SECTION≫

PCB-N	84-700-676-21	PH, TR circuit board
Q3	87-026-184-01	Photo transistor, TPS-603B
CNJ906	84-700-650-01	Connector ass'y, 2P

≪SWITCH-2 CIRCUIT BOARD SECTION≫

⚠PCB-0	84-700-669-21	Switch-2 circuit board
⚠S551	87-031-735-01	Push switch (POWER)
⚠NF551	87-030-090-01	Noise filter FK0B160MH13
	82-304-743-01	1P terminal
		<Capacitor>
⚠C551, 552	87-019-112-01	0.01μF 400V Spark killer

Symbol No.	Part No.	Description
≪POWER CIRCUIT BOARD SECTION≫		
⚠PCB-P	84-700-668-21	Power circuit board
IC501, 502, 503	87-027-973-01	IC, NJM7805
IC504	87-027-971-01	IC, NJM7915
IC505	87-027-972-01	IC, NJM7815
Q501	89-318-464-01	Transistor, 2SC1846 (R)
D501, 502, 506, 507, 508, 509, 510, 511	87-027-097-01	Diode, 1S1555
D503	87-027-720-01	Encapsulated diode S4NB-200
D504, 505	87-027-737-01	Diode, S1VB10
CNP1, 2	82-481-649-01	Pin, 2P
CNP3	87-032-897-01	Pin, 3P
CNP501	87-049-271-01	Pin, 2P
CNP502	84-700-685-01	Pin, 2P
CNJ501	84-700-646-01	Connector ass'y, 7P
CNJ502	84-700-647-01	Connector ass'y, 7P
CNJ503	84-700-645-01	Connector ass'y, 7P
		<Resistors>
R854	87-029-078-01	18Ω 1W Metal film
⚠R857, 858, 859, 860	87-029-108-01	1Ω 1/2W Fuse resistor
		<Capacitors>
C501	87-015-860-01	6800μF 16V Electrolytic
C503, 504	87-015-170-01	1000μF 50V Electrolytic
C505	87-015-247-01	10μF 25V Electrolytic
C509, 510	87-015-171-01	100μF 50V Electrolytic
≪INDICATOR-2 CIRCUIT BOARD SECTION≫		
D1	87-027-964-01	LED, A16-G (W/PCB-Q)
≪SL CIRCUIT BOARD SECTION≫		
PCB-R	84-700-721-11	SL circuit board
IC218	87-020-021-01	IC, TC40H004P
≪PHOTO INTERRUPTER CIRCUIT BOARD SECTION≫		
Q1, 2, D7, 8	87-026-191-01	Photo interrupter, PG-3-110 (W/PCB-S)
CNJ107	84-700-648-01	Connector ass'y, 4P
≪MISCELLANEOUS≫		
⚠T1	84-700-601-21	Power transformer (H model only)
⚠T1	84-700-732-01	Power transformer (E, Z models only)
⚠T1	84-700-604-01	Power transformer (K model only)
M1, 2	81-505-604-11	Reel motor
M3	84-700-627-01	Carrier motor ass'y
M4	84-700-715-11	Spindle motor
PL1, CNJ905	84-700-704-01	Pilot lamp
SOL1	87-045-198-01	Solenoid SDC-0531 (5H)
⚠	87-064-025-01	Fuse holder
⚠F501	87-035-213-01	Fuse 4A (H model only)
⚠F501	87-035-160-01	Fuse "T" 4A (E, Z models only)
	87-098-046-01	Fuse label, 4A (H model only)
	87-098-022-01	Fuse label, "T" 4A (E, K, Z models only)
⚠F501	87-035-192-01	Fuse "T" 4A (K model only)

Symbol No.	Part No.	Description
	84-700-616-51	Heatsink (for IC 501 ~505)
⚠	87-034-958-01	AC power cord (H model only)
⚠	87-034-877-01	AC power cord (E, Z models only)
⚠	87-034-975-01	AC power cord (K model only)
⚠	87-085-184-01	AC power cord bushing (H model only)
⚠	87-085-185-01	AC power cord bushing (E, K, Z models only)
	84-700-738-01	PU ass'y DAD pick-up PH02S
CNJ901	84-700-652-01	Connector ass'y, 8P (for S1 ~4)
CNJ902	84-700-651-01	Connector ass'y, 4P (for M1, 2)
CN910, 911, 912, 913, 914	84-700-703-01	Connector, Pick-up
JP-1	84-700-679-01	Jumper lead-1
JP-2	84-700-680-01	Jumper lead-2
S1, 3, 4	87-031-693-01	Micro switch (TRAY LOCK, ELEVATOR DOWN, ELEVATOR UP)
S2	87-031-758-01	Slide switch (TRAY EJECT)
⚠S6	87-031-586-01	Rotary switch (VOLTAGE SELECTOR) (H model only)

Note; Combination Circuit Board

The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

Combination circuit board A 84-700-660-21
A 84-700-661-21
B 84-700-662-21
G 84-700-667-21
H 84-700-668-21

Combination circuit board B 84-700-663-21
C 84-700-664-21
D 84-700-665-21
E 84-700-666-21
F 84-700-714-21

Combination circuit board C 84-700-670-21
I 84-700-671-21
J 84-700-672-21
K 84-700-673-21
L 84-700-674-21
M 84-700-675-21
N 84-700-676-21

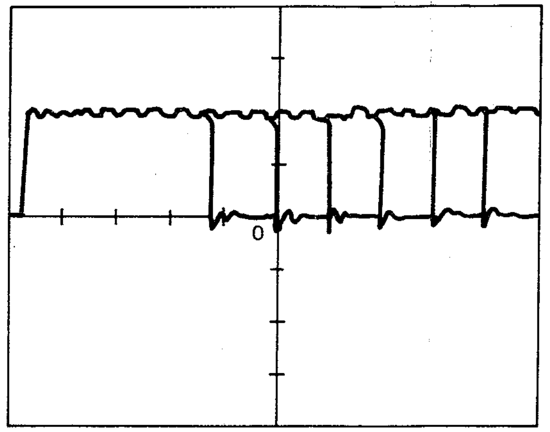
Combination circuit board D 84-700-667-21
O 84-700-669-21
P 84-700-668-21

⚠Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

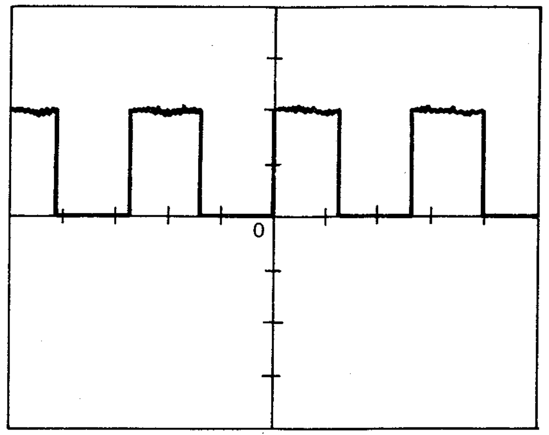
C-MOS IC handling precaution
The C-MOS IC's construction makes this part susceptible to damage by static electricity and so take sufficient care in regard to following articles.

1. Need to be put on conductive sheet, to be put in a metallic box and, to be wrapped by aluminium foil for transportation and deposit.
2. To use solder iron less than 40W (less than 260°C) of power consumption for soldering. But do not overheat more than 10 second.
3. Do not perform a conductivity test with a tester, etc. Refer to the circuit voltages of each part.
4. The ICs on the electrical parts which are indicated by an C-MOS IC symbol mark (⚡).

WAVEFORMS

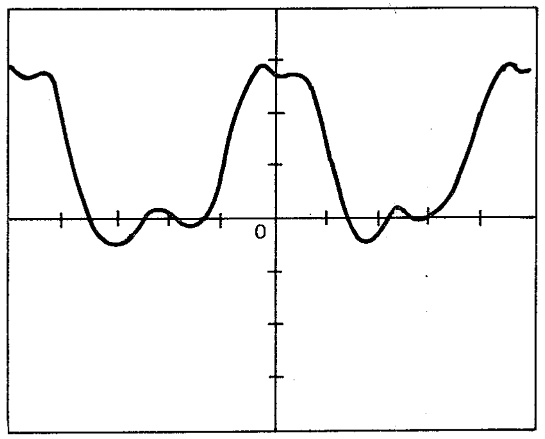


IC211 AL-800 22 pin 0.2μS/DIV 2V/DIV

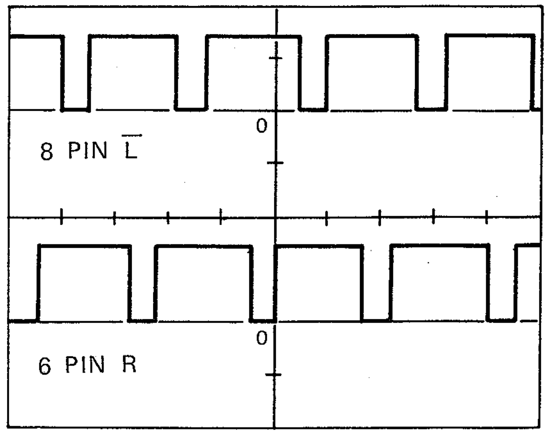


IC302 CX-7934 9 pin "RFCK" 50μS/DIV 2V/DIV

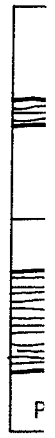
TP



IC211 AL-800 27 pin "PLCK" 0.05μS/DIV 2V/DIV



IC310 SN74LS26 6, 8 pin 10μS/DOV 5V/DIV



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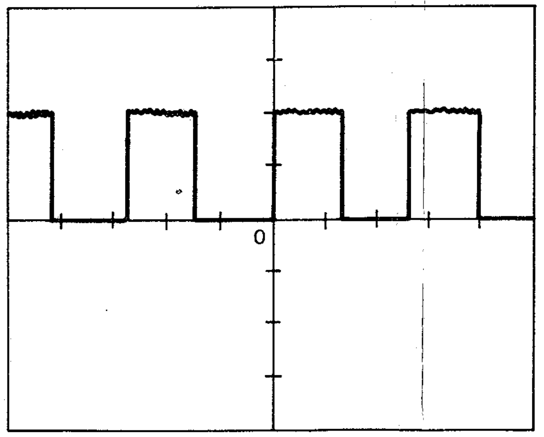
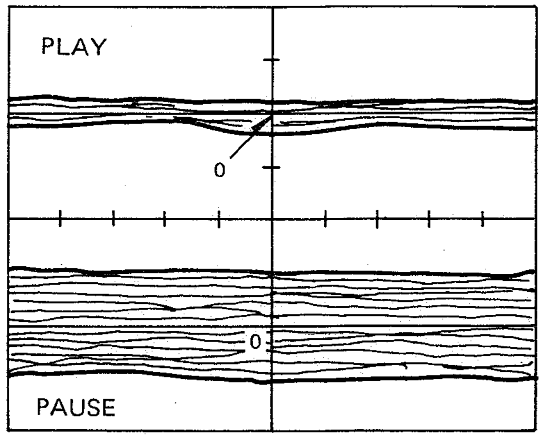


IC301 CX-7933 15 pin "WFCK" 50μS/DIV 2V/DIV



TP105 FOCUS ERROR VOLTAGE 0.5μS/DIV 0.5V/DIV

TP

nbol No.	Part No.	Description
	84-700-616-51	Heatsink (for IC 501 ~505)
	87-034-958-01	AC power cord (H model only)
	87-034-877-01	AC power cord (E, Z models only)
	87-034-975-01	AC power cord (K model only)
	87-085-184-01	AC power cord bushing (H model only)
	87-085-185-01	AC power cord bushing (E, K, Z models only)
	84-700-738-01	PU ass'y DAD pick-up PH02S
01	84-700-652-01	Connector ass'y, 8P (for S1 ~4)
02	84-700-651-01	Connector ass'y, 4P (for M1, 2)
0, 911, 2, 913, 4	84-700-703-01	Connector, Pick-up
	84-700-679-01	Jumper lead-1
	84-700-680-01	Jumper lead-2
, 4	87-031-693-01	Micro switch (TRAY LOCK, ELEVATOR DOWN, ELEVATOR UP)
	87-031-758-01	Slide switch (TRAY EJECT)
	87-031-586-01	Rotary switch (VOLTAGE SELECTOR) (H model only)

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bination circuit board A 84-700-660-21
4-700-661-21
4-700-662-21
4-700-667-21
4-700-668-21

Combination circuit board B 84-700-663-21
C 84-700-664-21
D 84-700-665-21
E 84-700-666-21
F 84-700-714-21

bination circuit board C 84-700-670-21
4-700-671-21
4-700-672-21
4-700-673-21
4-700-674-21
4-700-675-21
4-700-676-21

Combination circuit board D 84-700-667-21
O 84-700-669-21
P 84-700-668-21

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C-MOS IC's construction makes this part susceptible to damage atic electricity and so take sufficient care in regard to following rticles.

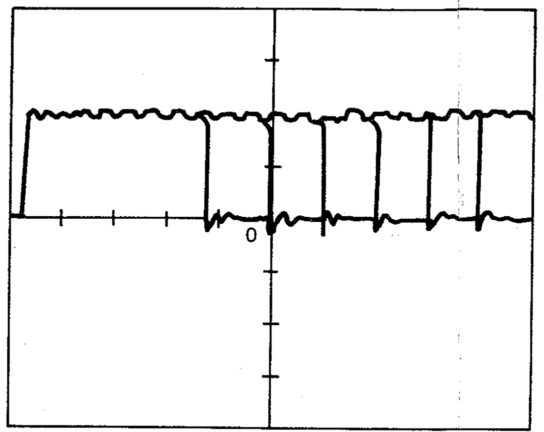
eed to be put on conductive sheet, to be put in a metallic box nd to be wrapped by aluminium foil for transportation and eposit.

o use solder iron less than 40W (less than 260°C) of power onsumption for soldering. But do not overheat more than 10 cond.

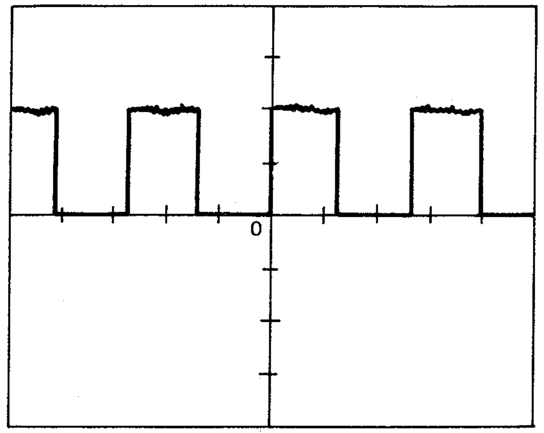
o not perform a conductivity test with a tester, etc. Refer to ne circuit voltages of each part.

he ICs on the electrical parts which are indicated by an C-IOS IC symbol mark (⚡).

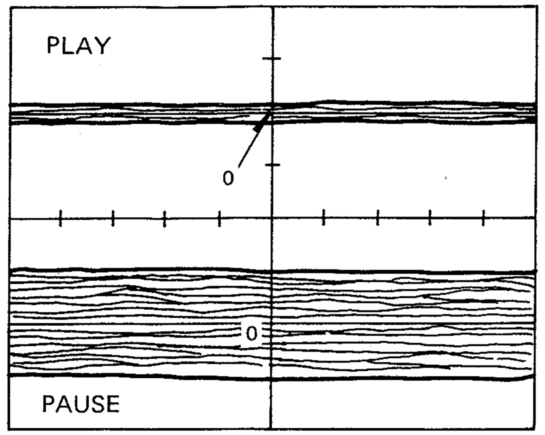
WAVEFORMS



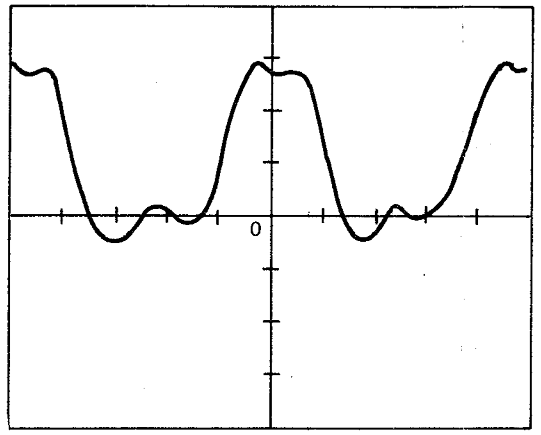
IC211 AL-800 22 pin 0.2μS/DIV
2V/DIV



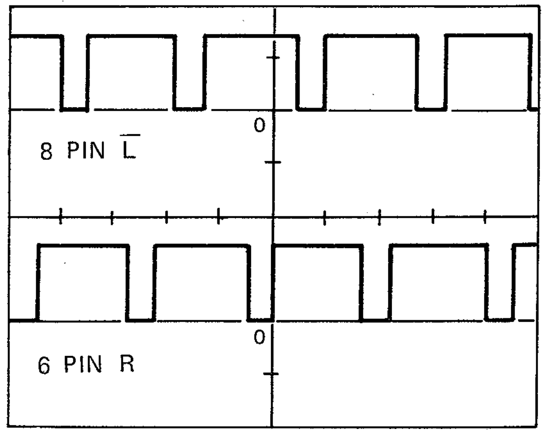
IC302 CX-7934 9 pin "RFCK" 50μS/DIV
2V/DIV



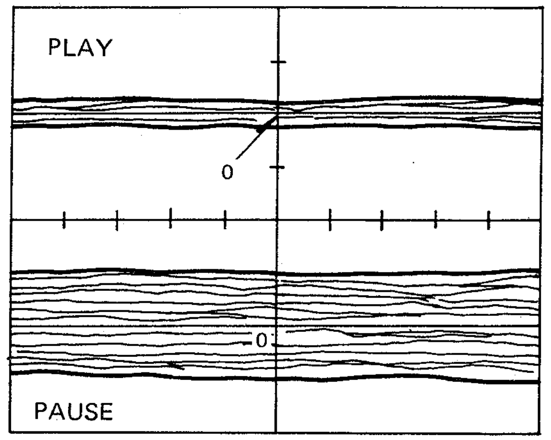
TP106 RADIAL COIL VOLTAGE 0.5μS/DIV
2V/DIV



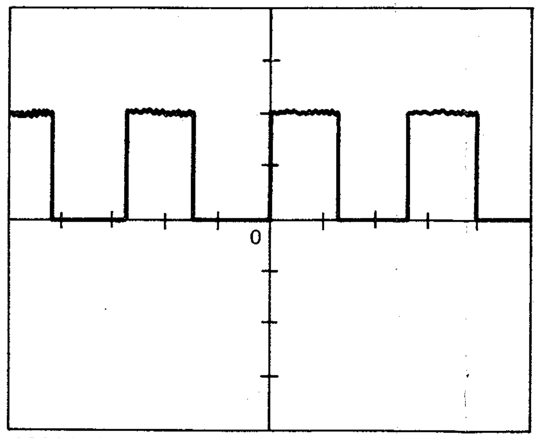
IC211 AL-800 27 pin "PLCK" 0.05μS/DIV
2V/DIV



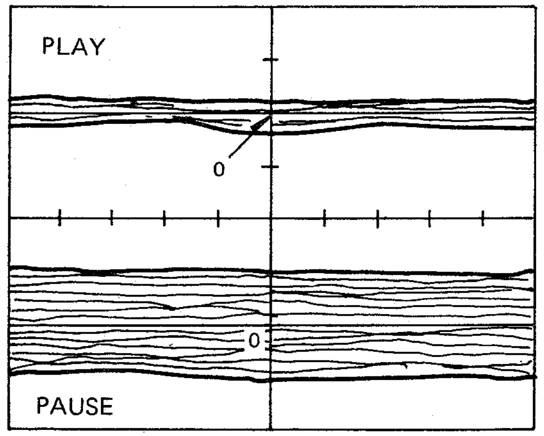
IC310 SN74LS26 6, 8 pin 10μS/DOV
5V/DIV



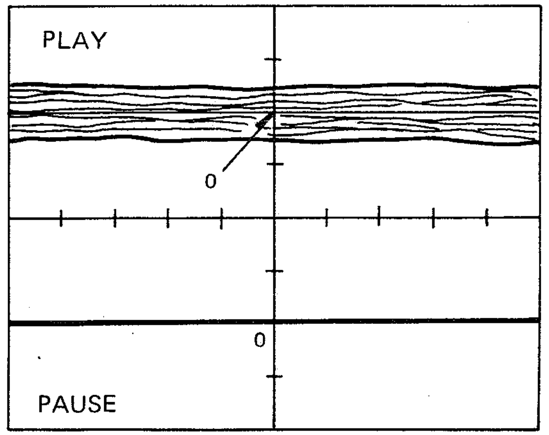
TP107 FOCUS ERROR VOLTAGE 0.5μS/DIV
1V/DIV



IC301 CX-7933 15 pin "WFCK" 50μS/DIV
2V/DIV



TP105 FOCUS ERROR VOLTAGE 0.5μS/DIV
0.5V/DIV



TP108 RADIAL COIL VOLTAGE 0.5μS/DIV
1V/DIV